

Geography Corpus (Chapter-Based) — Capitals and Major Cities

This book is an original, academic-style geography corpus designed for RAG indexing. It contains structured chapters, methods, concepts, country profiles, and applied case notes with named places to improve retrieval.

Chapter 1: Regional Geography of Europe

Overview

Europe is analyzed through physical geography (landforms, climate, hydrology) and human geography (cities, economies, migration, governance). The sections below provide profiles and notes that can be queried by city, country, method, or theme.

Key Concepts

- Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale.
- Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.
- Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize.
- Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure.
- Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture.
- Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Methods

- GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions.
- Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress.
- Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning.
- Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge.

Country and City Profiles

United Kingdom

Capital: London. Major cities: Birmingham, Manchester, Glasgow, Leeds, Liverpool, Bristol, Sheffield, Edinburgh, Cardiff, Belfast.

The UK is a maritime state with a temperate oceanic climate. Relief ranges from the Scottish Highlands and Pennines to lowland plains in England. Coastal processes shape estuaries, barrier

beaches, and erosion-prone cliffs.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

France

Capital: Paris. Major cities: Marseille, Lyon, Toulouse, Nice, Lille.

France spans Atlantic, Channel, and Mediterranean coasts. The Alps and Pyrenees influence climate gradients, tourism economies, and hydrology. River basins such as the Seine, Loire, Rhône, and Garonne support agriculture and urban corridors.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Germany

Capital: Berlin. Major cities: Hamburg, Munich, Cologne, Frankfurt, Stuttgart.

Germany's North European Plain, Central Uplands, and Alpine forelands create varied land use. Rivers including the Rhine, Elbe, and Danube structure settlement, trade, and flood management.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Applied Case Notes

Applied note: A planner might map earthquake exposure across Lyon and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Sheffield and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Leeds and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Nice and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Nice and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Nice and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Berlin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Manchester and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Cardiff and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Chapter 2: Regional Geography of Asia

Overview

Asia is analyzed through physical geography (landforms, climate, hydrology) and human geography (cities, economies, migration, governance). The sections below provide profiles and notes that can be queried by city, country, method, or theme.

Key Concepts

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- Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize.
- Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure.
- Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture.
- Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Methods

- GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions.
- Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress.
- Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning.
- Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge.

Country and City Profiles

Japan

Capital: Tokyo. Major cities: Osaka, Yokohama, Nagoya, Sapporo, Fukuoka.

Japan is an island arc on active plate boundaries. Steep mountains and short rivers concentrate settlement on coastal plains and increase exposure to earthquakes, tsunamis, and typhoons.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

India

Capital: New Delhi. Major cities: Mumbai, Bengaluru, Kolkata, Chennai, Hyderabad.

India's monsoon climate shapes agriculture, water storage, and seasonal hazards. The Himalayas influence river headwaters, while peninsular plateaus support diverse cropping systems and urban-industrial clusters.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

China

Capital: Beijing. Major cities: Shanghai, Shenzhen, Guangzhou, Chengdu, Wuhan.

China spans arid interiors, high plateaus, and humid coastal regions. Major river systems and transport corridors underpin manufacturing, logistics, and migration patterns.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Applied Case Notes

Applied note: A planner might map landslide exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across New Delhi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Fukuoka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Bengaluru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Bengaluru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Wuhan and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Wuhan and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Beijing and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Yokohama and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Mumbai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Chapter 3: Regional Geography of Africa

Overview

Africa is analyzed through physical geography (landforms, climate, hydrology) and human geography (cities, economies, migration, governance). The sections below provide profiles and notes that can be queried by city, country, method, or theme.

Key Concepts

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- Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize.
- Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure.
- Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture.
- Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Methods

- GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions.
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Country and City Profiles

Kenya

Capital: Nairobi. Major cities: Mombasa, Kisumu, Nakuru, Eldoret, Malindi.

Kenya's elevation range from coastal plains to highlands drives climate variation. The Rift Valley influences lakes, soils, and geothermal energy potential, while drought risk affects pastoral and farming systems.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Egypt

Capital: Cairo. Major cities: Alexandria, Giza, Port Said, Suez, Luxor.

Egypt's settlement and agriculture concentrate along the Nile. Irrigation, delta dynamics, and coastal management are central themes in a predominantly arid environment.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Ghana

Capital: Accra. Major cities: Kumasi, Tamale, Takoradi, Cape Coast, Tema.

Ghana spans coastal, forest, and savanna zones. Commodity exports, urban corridor growth, and land-cover change provide practical examples for economic and environmental geography.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Applied Case Notes

Applied note: A planner might map earthquake exposure across Nairobi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Suez and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Tema and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Kisumu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Luxor and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Eldoret and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Nairobi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Mombasa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Port Said and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Chapter 4: Regional Geography of North America

Overview

North America is analyzed through physical geography (landforms, climate, hydrology) and human geography (cities, economies, migration, governance). The sections below provide profiles and notes that can be queried by city, country, method, or theme.

Key Concepts

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- Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.
- Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize.
- Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure.
- Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture.
- Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Methods

- GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions.
- Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress.
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- Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge.

Country and City Profiles

United States

Capital: Washington, D.C.. Major cities: New York, Los Angeles, Chicago, Houston, Phoenix.

The United States spans tundra to subtropical climates and multiple mountain systems. Coastal megaregions, interior agricultural belts, and energy basins shape regional development and environmental policy debates.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Canada

Capital: Ottawa. Major cities: Toronto, Montreal, Vancouver, Calgary, Edmonton.

Canada's population concentrates near the U.S. border. Boreal forests, Arctic environments, and resource frontiers influence infrastructure planning, indigenous geographies, and climate adaptation.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Mexico

Capital: Mexico City. Major cities: Guadalajara, Monterrey, Puebla, Tijuana, León.

Mexico's high plateaus, volcanic belt, and coastal lowlands support diverse agriculture and industry. Exposure to earthquakes and hurricanes makes risk mapping and resilience planning important applied topics.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Applied Case Notes

Applied note: A planner might map storm surge exposure across Houston and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Guadalajara and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Houston and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Vancouver and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Houston and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Puebla and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Chapter 5: Regional Geography of South America

Overview

South America is analyzed through physical geography (landforms, climate, hydrology) and human geography (cities, economies, migration, governance). The sections below provide profiles and notes that can be queried by city, country, method, or theme.

Key Concepts

- Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale.
- Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.
- Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize.
- Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure.
- Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture.
- Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Methods

- GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions.
- Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress.
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- Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge.

Country and City Profiles

Brazil

Capital: Brasília. Major cities: São Paulo, Rio de Janeiro, Salvador, Fortaleza, Belo Horizonte.

Brazil includes the Amazon Basin, central plateaus, and a long Atlantic coastline. Land-use change, deforestation, agribusiness expansion, and metropolitan governance are recurring geographic themes.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Argentina

Capital: Buenos Aires. Major cities: Córdoba, Rosario, Mendoza, La Plata, Mar del Plata.

Argentina ranges from the humid Pampas to arid western basins and Patagonia. Agricultural exports, energy transitions, and transport corridors structure settlement patterns.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Peru

Capital: Lima. Major cities: Arequipa, Cusco, Trujillo, Chiclayo, Iquitos.

Peru's Andes, coastal deserts, and Amazon headwaters create steep environmental gradients. Hazards include earthquakes and landslides, while tourism and mining shape economic geography.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Applied Case Notes

Applied note: A planner might map flood exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Arequipa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Trujillo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Cusco and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Mendoza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across São Paulo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Mendoza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Chapter 6: Regional Geography of Australia & Oceania

Overview

Australia & Oceania is analyzed through physical geography (landforms, climate, hydrology) and human geography (cities, economies, migration, governance). The sections below provide profiles and notes that can be queried by city, country, method, or theme.

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Methods

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Country and City Profiles

Australia

Capital: Canberra. Major cities: Sydney, Melbourne, Brisbane, Perth, Adelaide.

Australia's arid interior contrasts with coastal population belts. Water scarcity, bushfire regimes, and reef conservation illustrate coupled human–environment systems.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

New Zealand

Capital: Wellington. Major cities: Auckland, Christchurch, Hamilton, Tauranga, Dunedin.

New Zealand's plate boundary setting produces mountains and frequent hazards. Maritime climates and fertile plains support agriculture, while cities balance growth with risk and environmental protection.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Papua New Guinea

Capital: Port Moresby. Major cities: Lae, Mount Hagen, Madang, Goroka, Kimbe.

Papua New Guinea has rugged terrain and high linguistic diversity. Accessibility constraints, disaster risk, and resource management shape development pathways.

Interpretation: capitals are often nodes of political power and national media, while large cities concentrate labor markets, universities, airports, and logistics hubs. A common research question is how transport investment changes commuting and neighborhood inequality.

Applied Case Notes

Applied note: A planner might map storm surge exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map flood exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Mount Hagen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results

using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map storm surge exposure across Tauranga and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Auckland and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map earthquake exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map drought exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map landslide exposure across Port Moresby and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Applied note: A planner might map heatwave exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Vancouver and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake

exposure across Fukuoka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Buenos Aires and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Trujillo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Iquitos and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mombasa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Buenos Aires and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide

exposure across Berlin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Edmonton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Cardiff and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Buenos Aires and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Houston and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Cardiff and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Osaka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map drought exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Beijing and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Paris and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Paris and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Stuttgart and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Liverpool and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Shanghai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Edmonton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across New Delhi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge

exposure across Berlin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Dunedin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Cairo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Wuhan and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Nakuru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm

surge exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Giza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Berlin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Sheffield and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Accra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Dunedin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Marseille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Madang and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Kisumu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map heatwave exposure across Adelaide and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Chengdu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map storm surge exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Marseille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lyon and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Canberra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Eldoret and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Port Said and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Mount Hagen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Eldoret and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across New York and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A

planner might map drought exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Osaka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Goroka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Ottawa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across New York and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Belfast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Cairo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Beijing and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A

planner might map heatwave exposure across Goroka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Hamburg and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Guadalajara and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Adelaide and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Montreal and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Edmonton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

flood exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Wellington and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Chengdu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Manchester and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Lyon and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Toronto and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Yokohama and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map

flood exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Mombasa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Hyderabad and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Mombasa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Brisbane and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Christchurch and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Guadalajara and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

heatwave exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Nagoya and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Wellington and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Cologne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across São Paulo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chennai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map heatwave exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Kolkata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Toulouse and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Nice and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner

might map storm surge exposure across Dunedin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Adelaide and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Bristol and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across New York and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Puebla and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Goroka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Nairobi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rosario and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map earthquake exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Shenzhen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across La Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across New Delhi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Belfast and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Sheffield and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Shenzhen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mount Hagen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Trujillo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight

from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Buenos Aires and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Lae and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing

lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Glasgow and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Wellington and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Tauranga and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Rosario and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tema and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Shanghai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Liverpool and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Houston and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to

evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Leeds and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Paris and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Melbourne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Melbourne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Shanghai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight

from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Stuttgart and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support

evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Nakuru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Vancouver and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization.

From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Dunedin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mombasa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty

bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to

evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cardiff and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Calgary and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Adelaide and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across London and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Edmonton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Toronto and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Nice and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban

expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Bristol and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Osaka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight

from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Beijing and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify

deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Christchurch and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Bristol and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Nagoya and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chennai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Beijing and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Cairo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Berlin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Port Moresby and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chicago and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and

plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Adelaide and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Phoenix and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Alexandria and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Monterrey and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Vancouver and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Cape Coast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Wuhan and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify

deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Fukuoka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

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from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Belfast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tauranga and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Bristol and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support

evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Lyon and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Tokyo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Manchester and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Christchurch and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support

evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Malindi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Yokohama and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Manchester and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Alexandria and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Nagoya and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Bristol and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across New Delhi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Vancouver and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing

lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Salvador and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lyon and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Cologne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Iquitos and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion,

and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Beijing and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Nice and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Iquitos and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Vancouver and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mexico City and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion,

and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Giza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Tema and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Lille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Lima and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Sydney and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Fortaleza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Cologne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight

from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tauranga and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Mombasa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify

deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Brasília and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Lima and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Vancouver and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Nakuru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Rosario and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty

bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local

knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Madang and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Canberra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Lyon and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Osaka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion,

and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Guangzhou and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Mar del Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Wuhan and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Bengaluru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across London and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing

lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Washington, D.C. and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Toronto and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Nakuru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Mar del Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Ottawa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Iquitos and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion

patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Port Moresby and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical

geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Kolkata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Bristol and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to

evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Luxor and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Guadalajara and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Nice and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across New York and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Cairo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Chengdu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Paris and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Kimbe and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion

patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Chengdu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Christchurch and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Port Moresby and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Lima and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chengdu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Tema and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Puebla and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion

patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Shenzhen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across London and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Leeds and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Paris and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tijuana and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Marseille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion

patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lae and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Manchester and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Edinburgh and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across New York and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Houston and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Suez and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local

knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across New York and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Bristol and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Chennai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Paris and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Luxor and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Rosario and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied

through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Chengdu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Buenos Aires and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Tema and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mombasa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Edmonton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Suez and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mexico City and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and

network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Shanghai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Chicago and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Canberra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Guadalajara and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Córdoba and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across New York and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network

connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Osaka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Arequipa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Vancouver and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Melbourne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Cusco and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Iquitos and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map earthquake exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Toulouse and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support

evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Rosario and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Cape Coast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Eldoret and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Leeds and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Mombasa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Buenos Aires and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Cardiff and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing

lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization.

From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Washington, D.C. and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Kolkata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Birmingham and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Sheffield and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support

evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Yokohama and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Houston and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization.

From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Phoenix and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Nairobi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Beijing and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Puebla and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban

expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Toronto and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Dunedin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Cusco and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tijuana and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Cusco and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Bristol and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan

interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across La Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Nakuru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Glasgow and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Salvador and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Sheffield and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty

bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Kisumu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Fukuoka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Lima and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local

knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Rosario and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Lyon and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mendoza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Glasgow and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Calgary and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Puebla and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tauranga and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify

deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tijuana and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Giza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Christchurch and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results

using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Toronto and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion,

and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Accra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Kisumu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across León and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Lyon and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight

from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tijuana and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across New York and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Lima and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing

lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Adelaide and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Chiclayo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization.

From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Sapporo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Marseille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mombasa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty

bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Glasgow and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Houston and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and

plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Chennai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Belfast and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Nice and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Chiclayo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Giza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty

bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan

interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Accra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Toronto and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Bengaluru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Bengaluru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mount Hagen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Munich and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Osaka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to

evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across São Paulo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Brisbane and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply,

hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Shenzhen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Port Said and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Nice and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Toronto and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Glasgow and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion,

deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Melbourne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Kumasi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Melbourne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Wellington and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Leeds and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Los Angeles and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a

neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Houston and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Lille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Bristol and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Suez and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean

currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Brisbane and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Shanghai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chiclayo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Sydney and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Adelaide and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Fortaleza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Mar del Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation,

tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Nairobi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Madang and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Goroka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Auckland and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Edmonton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Montreal and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Mombasa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Leeds and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as

monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Yokohama and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Lima and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Nairobi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Edmonton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied

note: A planner might map landslide exposure across Rio de Janeiro and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Giza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Luxor and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Los Angeles and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Chengdu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Eldoret and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Nairobi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought

exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Giza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Edmonton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Suez and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Fukuoka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Madang and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities

specialize. Applied note: A planner might map storm surge exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Wuhan and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Yokohama and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map

landslide exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Osaka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Kimbe and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Wuhan and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tijuana and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map storm surge exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mount Hagen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Puebla and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Liverpool and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood

exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Sheffield and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Edmonton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Marseille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mendoza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

earthquake exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Cairo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Lyon and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Wellington and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Luxor and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought

exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Shenzhen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Fortaleza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Nairobi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Toronto and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Nagoya and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Takoradi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A

planner might map landslide exposure across Bristol and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Nice and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Tauranga and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Marseille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Hyderabad and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across New York and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mumbai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Leeds and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Frankfurt and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave

exposure across Cusco and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cologne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Port Said and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across New Delhi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Adelaide and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Malindi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Edmonton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Trujillo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Guadalajara and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner

might map earthquake exposure across Stuttgart and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Takoradi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Cologne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Madang and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Port Said and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Hyderabad and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Edinburgh and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought

exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across London and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Glasgow and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide

exposure across Hyderabad and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Fortaleza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Eldoret and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Nakuru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Adelaide and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Accra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Auckland and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A

planner might map flood exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Madang and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Dunedin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Canberra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Kolkata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mendoza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across London and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities

specialize. Applied note: A planner might map flood exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across New York and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Nice and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Christchurch and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Cape Coast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Kumasi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

heatwave exposure across Stuttgart and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Salvador and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Iquitos and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across La Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Marseille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cairo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Accra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Brasília and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm

surge exposure across Cologne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Wellington and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Bengaluru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Madang and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Osaka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across New Delhi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Lyon and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

storm surge exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Guadalajara and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Dunedin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Nakuru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Edinburgh and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Toulouse and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Vancouver and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map earthquake exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across New York and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Chengdu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Eldoret and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Cusco and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Los Angeles and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map earthquake exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Edinburgh and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Hyderabad and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Madang and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Lyon and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Calgary and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Nice and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner

might map drought exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Leeds and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Ottawa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Vancouver and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mar del Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map drought exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mar del Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Liverpool and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Arequipa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Nairobi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought

exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Giza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Houston and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Nakuru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Nairobi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tokyo and test how water-demand management changes expected

losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tema and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Nice and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Sydney and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to

evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across São Paulo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Ottawa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Los Angeles and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Chicago and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Edmonton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Frankfurt and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Chennai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Edmonton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Toronto and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion

patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Tijuana and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Mombasa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Adelaide and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Córdoba and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from

local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Lyon and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across León and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and

local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Lae and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Beijing and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Tauranga and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support

evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Sapporo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Luxor and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Vancouver and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Cape Coast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Shanghai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across New York and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan

interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Guangzhou and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization.

From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Cape Coast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing

lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Cardiff and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Monterrey and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization.

From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Liverpool and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Dunedin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from

local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion

patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Goroka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Edinburgh and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Auckland and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Brisbane and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Nice and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization.

From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Giza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support

evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Ottawa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Cape Coast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify

deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Mendoza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Berlin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across New Delhi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across London and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Phoenix and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Tauranga and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Kimbe and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Frankfurt and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Guangzhou and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing

lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Iquitos and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Edinburgh and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cairo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Kumasi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across New Delhi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Marseille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to

evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across La Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Washington, D.C. and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nakuru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight

from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Bristol and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify

deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across London and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Adelaide and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Cusco and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water

supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Toronto and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Houston and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Berlin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across New York and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Lima and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A

planner might map landslide exposure across Tijuana and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Edinburgh and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Edinburgh and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Adelaide and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Marseille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Christchurch and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note:

A planner might map earthquake exposure across Leeds and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Tema and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Melbourne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Lima and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Manchester and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across London and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Rosario and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Wuhan and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Dunedin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map drought exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Kolkata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Melbourne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Los Angeles and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought

exposure across Calgary and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Glasgow and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Hyderabad and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Edmonton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Guangzhou and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide

exposure across Cape Coast and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Edinburgh and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lyon and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Nairobi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Arequipa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Mombasa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Osaka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Rosario and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide

exposure across Giza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Lima and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Berlin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Port Moresby and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Fukuoka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Salvador and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

flood exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Cairo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Canberra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Dunedin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Vancouver and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Ottawa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Sapporo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Houston and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake

exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Kolkata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across León and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Toronto and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Toulouse and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across São Paulo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Hamburg and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

storm surge exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tema and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Lille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Fukuoka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Beijing and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Mombasa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across La Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

storm surge exposure across Cologne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Nakuru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Cologne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Iquitos and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Ottawa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across La Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Lille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Brisbane and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chengdu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake

exposure across Bengaluru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Nakuru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Stuttgart and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Tauranga and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mumbai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Toulouse and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide

exposure across Malindi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Wellington and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Port Moresby and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Chengdu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Monterrey and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Buenos Aires and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture.

Applied note: A planner might map heatwave exposure across Belfast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Nakuru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Washington, D.C. and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Liverpool and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map earthquake exposure across Brisbane and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Guangzhou and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Munich and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Rosario and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Cologne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map storm surge exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Mombasa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Beijing and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mombasa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Toulouse and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Malindi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Mount Hagen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across

Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Birmingham and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chiclayo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Melbourne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Goroka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Giza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Bengaluru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

landslide exposure across Nairobi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Leeds and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across London and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Kimbe and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Salvador and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Cusco and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

storm surge exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Chiclayo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Osaka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Rosario and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mendoza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Stuttgart and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Brisbane and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake

exposure across Lyon and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Dunedin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Giza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Tijuana and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Stuttgart and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Chennai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Fukuoka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Belfast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

earthquake exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Perth and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Shanghai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Cusco and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note:

A planner might map landslide exposure across Adelaide and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kisumu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Mar del Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Port Moresby and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Cape Coast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Sydney and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

earthquake exposure across Cologne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Shanghai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Luxor and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Toronto and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Cardiff and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Chicago and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Giza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Nakuru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map

earthquake exposure across Christchurch and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Nice and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Tauranga and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space.

Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across London and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Lima and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave

exposure across Nairobi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Ottawa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Nakuru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space.

Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Port Moresby and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Kisumu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Vancouver and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Cairo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought

exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Los Angeles and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Belfast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across New York and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Mendoza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Guadalajara and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map

landslide exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Dunedin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Christchurch and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Buenos Aires and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Houston and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across New York and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Iquitos and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Cusco and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map storm surge exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Port Said and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Suez and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Manchester and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Salvador and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Kimbe and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied

note: A planner might map earthquake exposure across Guadalajara and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Washington, D.C. and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Rosario and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Vancouver and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Liverpool and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map flood exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mombasa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across León and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Montreal and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map

flood exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Toronto and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Rosario and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Melbourne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Lima and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Lima and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Christchurch and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Mendoza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge

exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Madang and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Shenzhen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space.

Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across New York and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Perth and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

earthquake exposure across Chengdu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Cairo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Dunedin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Shenzhen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Nice and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Bengaluru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Marseille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Trujillo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Leeds and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Hamburg and test how building-code enforcement changes expected

losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Mombasa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Bengaluru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Leeds and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Vancouver and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map storm surge exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

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Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Giza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Buenos Aires and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Madang and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

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Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

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drought exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Toulouse and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Shanghai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Wellington and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Nagoya and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across León and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chiclayo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner

might map landslide exposure across Los Angeles and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Chennai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Nairobi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Sydney and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Shenzhen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Kumasi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Beijing and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Malindi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Frankfurt and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave

exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Osaka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Cardiff and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Puebla and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Luxor and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Mombasa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Los Angeles and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

earthquake exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Guadalajara and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Luxor and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Birmingham and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mendoza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Puebla and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Lyon

and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Ottawa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Nakuru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Cairo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Lyon and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Houston and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Hamburg and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mendoza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood

exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Shenzhen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Cape Coast and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Tema

and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Chicago and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Melbourne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Wellington and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Malindi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Hyderabad and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Bristol and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner

might map storm surge exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Belo Horizonte and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Chengdu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Frankfurt and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Dunedin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map flood exposure across Monterrey and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Birmingham and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Shanghai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Kisumu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Luxor and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Shanghai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Toulouse and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

earthquake exposure across Fukuoka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cairo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Toulouse and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Tema and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Paris and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm

surge exposure across Iquitos and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Perth and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Lille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Monterrey and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Puebla and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note:

A planner might map earthquake exposure across Sheffield and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Lyon and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Leeds and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Birmingham and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Edmonton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Goroka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Liverpool and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Nairobi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across São Paulo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Toronto and test how transit-oriented development changes expected

losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Birmingham and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Leeds and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Nice and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Glasgow and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mount Hagen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map heatwave exposure across Chicago and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Port Said and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Chiclayo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Stuttgart and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Accra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Sydney and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Toulouse and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Shenzhen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support

evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Mar del Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across London and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Monterrey and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Giza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Accra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing

lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Accra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical

geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across New Delhi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Bengaluru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across New York and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Wellington and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and

local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Lae and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Birmingham and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Nice and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time,

cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chicago and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Guangzhou and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Shenzhen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Belfast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network

connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Brisbane and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Osaka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply,

hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Stuttgart and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Edinburgh and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Cologne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

flood exposure across Fukuoka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Liverpool and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Guadalajara and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mombasa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Glasgow and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood

exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Mumbai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Bengaluru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Tema and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across São Paulo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Hyderabad and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A

planner might map landslide exposure across Madang and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Mar del Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Manchester and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Edinburgh and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Cusco and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Córdoba and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Tauranga and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Yokohama and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Nakuru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map flood exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Nagoya and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Calgary and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Lima and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Fukuoka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

earthquake exposure across Chennai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Belfast and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across London and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Cape Coast and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Port Moresby and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave

exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across León and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Beijing and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Nice and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Vancouver and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Manchester and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Chiclayo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Guadalajara and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide

exposure across Beijing and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Wuhan and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Vancouver and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Chennai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Belfast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Beijing and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Los Angeles and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave

exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Lille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Malindi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Madang and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Bengaluru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

flood exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Toronto and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Washington, D.C. and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across London and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Paris and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Bristol and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Hyderabad and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Leeds and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide

exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Chiclayo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Chicago and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Tokyo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Fortaleza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Osaka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake

exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Bengaluru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Sydney and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across La Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave

exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Port Said and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Los Angeles and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Hyderabad and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Chiclayo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Cardiff and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Giza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Leeds and test how transit-oriented development changes expected

losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Manchester and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Adelaide and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Auckland and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Chengdu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Paris and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide

exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Fukuoka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Nagoya and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Lima and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Houston and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Toulouse and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Vancouver and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Adelaide and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map heatwave exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across London and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Kolkata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Birmingham and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Lima and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Melbourne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner

might map flood exposure across Houston and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Rosario and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Hamburg and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Mendoza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Belfast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Edinburgh and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

flood exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Liverpool and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Cape Coast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Tijuana and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Leeds and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Beijing and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities

specialize. Applied note: A planner might map drought exposure across Buenos Aires and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Arequipa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Stuttgart and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Salvador and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across London and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Kolkata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Rosario and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Fukuoka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

heatwave exposure across Munich and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Sapporo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Port Moresby and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Belfast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Perth and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Monterrey and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Shenzhen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Wellington and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought

exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across León and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Glasgow and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

flood exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across São Paulo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Sydney and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Goroka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Sheffield and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Beijing and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Giza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

landslide exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Stuttgart and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Nagoya and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Melbourne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Toronto and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Leeds and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Dunedin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

storm surge exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mombasa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Chennai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Cusco and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Glasgow and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Tema and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Sydney and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Adelaide and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across New Delhi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across

Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Vancouver and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Wellington and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Chicago and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Wellington and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Mount Hagen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Cologne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Mount Hagen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Cape

Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Lille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Brasília and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across São Paulo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Christchurch and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Toulouse and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Guadalajara and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map

drought exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Malindi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Washington, D.C. and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Chicago and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Los Angeles and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Phoenix and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Hyderabad and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Salvador and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide

exposure across Chiclayo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Hyderabad and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Birmingham and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Munich and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Vancouver and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Chiclayo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Kisumu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Auckland and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide

exposure across Tema and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Toulouse and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Osaka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Nagoya and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Kisumu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kumasi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Cusco and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map earthquake exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Frankfurt and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Berlin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Cusco and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Chicago and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Yokohama and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across New York and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Fukuoka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map landslide exposure across Buenos Aires and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mar del Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Port Said and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Chiclayo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nairobi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake

exposure across Chiclayo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Lima and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across León and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Hyderabad and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood

exposure across Shenzhen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Bristol and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Wuhan and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Wellington and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across La Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map storm surge exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Berlin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Nagoya and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Auckland and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Sapporo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge

exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Birmingham and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Nagoya and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Paris and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Cusco and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm

surge exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Guangzhou and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Sydney and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Port Said and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Vancouver and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Lima and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mendoza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge

exposure across Port Said and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Luxor and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

landslide exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Nagoya and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Shenzhen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Phoenix and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Nagoya and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Puebla and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Nagoya and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map

landslide exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Tauranga and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Monterrey and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Trujillo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Brasília and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Ottawa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Mombasa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Monterrey and test how transit-oriented

development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Leeds and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Belfast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Belfast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Arequipa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner

might map earthquake exposure across Buenos Aires and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Brasília and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cardiff and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across New Delhi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Lille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Trujillo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across New Delhi and test how risk-informed zoning changes expected

losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Belfast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across London and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake

exposure across Cairo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Washington, D.C. and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Stuttgart and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Sapporo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mendoza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map storm surge exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mar del Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mombasa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Cardiff and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought

exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Los Angeles and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Nakuru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Goroka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Hamburg and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map

drought exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Mombasa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Wellington and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Nakuru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

flood exposure across Edmonton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Adelaide and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Luxor and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Sapporo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Fortaleza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Berlin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Córdoba and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Tauranga and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Frankfurt and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Wellington and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Suez and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map landslide exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Lae and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Guangzhou and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Buenos Aires and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Accra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Mexico City and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lae and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map flood exposure across New Delhi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Lae and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Tema and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Toulouse and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Cardiff and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map earthquake exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Salvador and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Luxor and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Port Said and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Toronto and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Kumasi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought

exposure across Cusco and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Berlin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Leeds and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Birmingham and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Buenos Aires and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Takoradi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mar del Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner

might map earthquake exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Mombasa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Belfast and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across London and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tijuana and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Stuttgart and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Melbourne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Chennai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Tauranga and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map

landslide exposure across Edmonton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Stuttgart and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Munich and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Tauranga and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Salvador and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Edinburgh and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

drought exposure across Tema and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Kisumu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Mar del Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Los Angeles and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chennai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Paris and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Birmingham and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner

might map earthquake exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Belfast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Edinburgh and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map storm surge exposure across Belfast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Lille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Port Moresby and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Hamburg and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Kisumu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Suez and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Toulouse and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Wellington and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Houston and test how

water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Perth and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Edinburgh and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tokyo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mendoza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A

planner might map flood exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mendoza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Tema and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Chiclayo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Wellington and test how building-code enforcement

changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Frankfurt and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Puebla and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Sheffield and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Houston and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Trujillo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Puebla and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Wellington and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across La Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local

knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mexico City and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty

bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Paris and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mendoza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion

patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Shanghai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Nice and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Mexico City and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Chicago and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support

evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Monterrey and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Beijing and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a

physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Edinburgh and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Port Moresby and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Dunedin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local

stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to

evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Vancouver and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization.

From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Adelaide and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Vancouver and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and

qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Perth and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across New Delhi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to

evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Rosario and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Beijing and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography

perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Chennai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude

gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across New York and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply,

hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Mendoza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Iquitos and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Luxor and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and

high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Toulouse and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Fukuoka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply,

hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Perth and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Kolkata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Los Angeles and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Accra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude

gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Trujillo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water

supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Bengaluru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Manchester and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Salvador and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean

currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across New York and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Guangzhou and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply,

hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Toulouse and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Ottawa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a

neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mombasa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Tokyo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Cape Coast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Port Moresby and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Ottawa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Belo Horizonte and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion,

deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across La Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Toronto and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Washington, D.C. and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tijuana and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across New Delhi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Glasgow and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Luxor and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition,

glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Birmingham and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Mendoza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Liverpool and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Lima and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Perth and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a

neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Toronto and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Chicago and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Melbourne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Giza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Nairobi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Accra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Trujillo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear

clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Bengaluru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Fukuoka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Chicago and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across New Delhi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Kolkata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Beijing and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rosario and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Montreal and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network

connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tema and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Manchester and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tauranga and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Tauranga and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Giza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Mount Hagen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across New Delhi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Auckland and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Guangzhou and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mombasa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Mexico City and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a

neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Nice and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Sheffield and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water

supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Hamburg and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Adelaide and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Takoradi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host

governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Takoradi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Leeds and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms

influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Shanghai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Osaka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Arequipa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Belo Horizonte and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Cape Coast and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm

surge exposure across Fukuoka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Accra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Cardiff and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Rosario and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Perth and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Toulouse and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Applied note: A planner might map flood exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Wuhan and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Giza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Port Said and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Marseille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Hyderabad and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm

surge exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Houston and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Kimbe and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Cusco and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Kisumu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Tema and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map landslide exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Birmingham and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across New Delhi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tema and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Marseille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Goroka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Sheffield and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Buenos Aires and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mumbai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Wellington and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood

exposure across Trujillo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Manchester and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Sheffield and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mendoza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Bristol and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm

surge exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Chiclayo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Wuhan and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Belfast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Suez and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Nairobi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied

note: A planner might map heatwave exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Eldoret and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Mendoza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Nakuru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Los Angeles and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Iquitos and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Mount Hagen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Osaka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rosario and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner

might map heatwave exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Cardiff and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Beijing and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Mount Hagen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Munich and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Bristol and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Goroka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Auckland and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought

exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Lille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Toulouse and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Edinburgh and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Iquitos and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Iquitos and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Edmonton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Sheffield and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Bengaluru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought

exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Vancouver and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Port Said and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across São Paulo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across León and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Wellington and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood

exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Kolkata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Nakuru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space.

Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Wellington and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Leeds and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Suez and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood

exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Dunedin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Cardiff and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Lima and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Manchester and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Liverpool and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Goroka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Berlin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought

exposure across Toulouse and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across New Delhi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Salvador and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Ottawa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Accra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Puebla and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across La Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Kolkata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map

storm surge exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Houston and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Hyderabad and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Brasília and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Leeds and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Tijuana and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map landslide exposure across Edinburgh and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Houston and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Toronto and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Berlin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Stuttgart and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Chennai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Birmingham and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Mexico City and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map earthquake exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Salvador and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Malindi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across La Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mumbai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Madang and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Sheffield and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Phoenix and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Edmonton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave

exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Giza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Luxor and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Guadalajara and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Osaka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A

planner might map drought exposure across Sheffield and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Suez and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Birmingham and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Nagoya and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Luxor and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Luxor and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Los Angeles and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide

exposure across Shenzhen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Cardiff and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across New York and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Birmingham and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Osaka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Mombasa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Munich and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide

exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Fukuoka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Toronto and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Adelaide and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map drought exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Lille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Edinburgh and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Kisumu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Sheffield and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Osaka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood

exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Madang and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Alexandria and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Hyderabad and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Iquitos and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Dunedin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Glasgow and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Dunedin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map storm surge exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Giza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Accra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Berlin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Leeds and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Guadalajara and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Nakuru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map heatwave exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mar del Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Toulouse and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Manchester and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Buenos Aires and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Lima and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Chicago and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map earthquake exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Berlin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Malindi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Wuhan and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Córdoba and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Belo Horizonte and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Liverpool and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Bristol and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map landslide exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Córdoba and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Córdoba and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Edmonton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Melbourne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Mexico City and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought

exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Sheffield and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Arequipa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Iquitos and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Edmonton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Tijuana and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map landslide exposure across Port Moresby and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lyon and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Nakuru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Ottawa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Cardiff and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Melbourne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Toulouse and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

storm surge exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Frankfurt and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Montreal and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Monterrey and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Vancouver and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Lae and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Iquitos and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Malindi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Montreal and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map landslide exposure across New York and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Bristol and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Houston and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Nagoya and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cusco and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Monterrey and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Shenzhen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Nairobi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave

exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Tema and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Melbourne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across La Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Dunedin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Wellington and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map heatwave exposure across Cardiff and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chengdu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Wellington and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Mumbai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Frankfurt and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Washington, D.C. and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across New York and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Frankfurt and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map flood exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Arequipa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Bengaluru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Melbourne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Cardiff and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Nairobi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave

exposure across Toronto and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Luxor and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Christchurch and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across León and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Hyderabad and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Munich and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Sheffield and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Brasília and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map storm surge exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Canberra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Liverpool and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Leeds and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Manchester and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map

storm surge exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across São Paulo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Birmingham and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Belfast and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Luxor and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Salvador and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge

exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Puebla and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Buenos Aires and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tijuana and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Wuhan and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Houston and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Cardiff and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Lille and

test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Iquitos and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Alexandria and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Monterrey and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across León and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Hyderabad and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Accra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Applied note: A planner might map earthquake exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Fukuoka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Sheffield and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Guadalajara and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across New York and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across London and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Dunedin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Leeds and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

flood exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Houston and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Glasgow and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across São Paulo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Bengaluru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Los Angeles and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge

exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Monterrey and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Wellington and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Cusco and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Leeds and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Giza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought

exposure across Ottawa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Fukuoka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Leeds and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Eldoret and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Cardiff and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Guangzhou and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Christchurch and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map earthquake exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Monterrey and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Cairo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Marseille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Canberra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave

exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across São Paulo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Bristol and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Edinburgh and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Chiclayo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note:

A planner might map heatwave exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Cape Coast and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Takoradi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Montreal and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Arequipa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across New York and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm

surge exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Christchurch and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across New York and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across León and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Kolkata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Malindi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Toulouse and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map flood exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Accra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Manchester and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Iquitos and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Iquitos and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Brisbane and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Cairo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide

exposure across Edmonton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Melbourne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Kolkata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tijuana and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mombasa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Salvador and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Wellington and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Brisbane and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Houston and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Shenzhen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Lima and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map flood exposure across Nice and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Guangzhou and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Chengdu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Edmonton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Madang and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Giza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tijuana and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Marseille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

landslide exposure across Luxor and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Lille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Los Angeles and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Brasília and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Osaka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Belfast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Kisumu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across New York and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

drought exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Nice and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Leeds and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Rosario and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Puebla and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Melbourne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Cardiff and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner

might map earthquake exposure across Mendoza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Toulouse and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Monterrey and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Belfast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Shanghai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Kimbe and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mexico City and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A

planner might map storm surge exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Córdoba and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Adelaide and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Wuhan and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Tema and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Salvador and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across New York and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A

planner might map storm surge exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Arequipa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Toulouse and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Goroka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Goroka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Toronto and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across León and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Suez and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

earthquake exposure across Malindi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Tema and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Sheffield and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Guadalajara and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Manchester and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Leeds and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Kolkata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Hamburg and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Fukuoka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Iquitos and test how risk-informed zoning changes expected losses. A geographer

would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Tijuana and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Lae and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Toronto and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Kisumu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Marseille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map flood exposure across Mendoza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Perth and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Canberra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Nagoya and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Chiclayo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tokyo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map storm surge exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Lae and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Vancouver and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Fukuoka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Nairobi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map

storm surge exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Washington, D.C. and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Eldoret and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Kisumu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Bengaluru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Lae and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Munich and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Lille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

earthquake exposure across Berlin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Adelaide and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Toulouse and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Puebla and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Paris and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Wuhan and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

heatwave exposure across Malindi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kumasi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Buenos Aires and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Tauranga and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Beijing and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Tauranga and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Shanghai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood

exposure across Kisumu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Nakuru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Mumbai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Toulouse and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across León and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Rosario and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map flood exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Sheffield and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave

exposure across Osaka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Belfast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Sheffield and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Frankfurt and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Kolkata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Mendoza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Hyderabad and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge

exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across London and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Madang and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Paris and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map storm surge exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Malindi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Osaka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Sheffield and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Christchurch and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Perth and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Port Said and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Beijing and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might

map landslide exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Port Said and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Nakuru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Mar del Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Yokohama and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Giza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Wuhan and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm

surge exposure across Paris and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Puebla and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Marseille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Guadalajara and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Arequipa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Rosario and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Luxor and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Cusco and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

flood exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Adelaide and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Marseille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Cape Coast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Nice and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Hamburg and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Cairo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Adelaide and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might

map earthquake exposure across Vancouver and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Cusco and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chengdu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Giza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Ottawa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Chicago and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Mombasa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map drought exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Malindi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Buenos Aires and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Chicago and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mendoza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Los Angeles and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm

surge exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Marseille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Cape Coast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Hyderabad and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Shenzhen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Malindi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Kimbe and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Hyderabad and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Malindi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

earthquake exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Bengaluru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Belfast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Hyderabad and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Los Angeles and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Auckland and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Lae and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note:

A planner might map landslide exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Stuttgart and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Leeds and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Toronto and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Wuhan and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Vancouver and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Auckland and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map earthquake exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Fortaleza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Sapporo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Kolkata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Munich and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Sheffield and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Cardiff and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might

map earthquake exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Sheffield and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Luxor and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Buenos Aires and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Tema and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Perth and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Applied note: A planner might map landslide exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Iquitos and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Rosario and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Frankfurt and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Manchester and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood

exposure across Giza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Giza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Sheffield and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across New York and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Osaka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across São Paulo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Paris and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Adelaide and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

drought exposure across Takoradi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across New York and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Fukuoka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across New York and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Accra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Toulouse and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tema and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across La Plata and test how water-demand management changes expected

losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Chiclayo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Berlin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Trujillo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Malindi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Luxor and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map

earthquake exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across La Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Mombasa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Cardiff and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Nairobi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mar del Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Lima and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Leeds and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Beijing and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Adelaide and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Los Angeles and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Monterrey and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map heatwave exposure across Edmonton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Luxor and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Rosario and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Puebla and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Bristol and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Glasgow and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Christchurch and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mombasa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across São Paulo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought

exposure across Arequipa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Cardiff and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Guadalajara and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Port Said and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Giza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Lille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Buenos Aires and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood

exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Bristol and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Buenos Aires and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Stuttgart and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Los Angeles and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Salvador and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Brisbane and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Kumasi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Tauranga and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Trujillo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map flood exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Leeds and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Cape Coast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Houston and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood

exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Osaka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Salvador and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Cusco and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Mexico City and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Leeds and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kolkata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Munich and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map

landslide exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Trujillo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Toronto and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Port Said and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Glasgow and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Edmonton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map storm surge exposure across Madang and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Washington, D.C. and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Nairobi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Sheffield and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Madang and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Tema and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mexico City and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mount Hagen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Tauranga and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner

might map earthquake exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Trujillo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Bengaluru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Monterrey and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Mendoza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Nagoya and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Los Angeles and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Cusco and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Applied note: A planner might map heatwave exposure across Edinburgh and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Mombasa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Lyon and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Guadalajara and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Dunedin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Hyderabad and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Osaka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner

might map heatwave exposure across Buenos Aires and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Chiclayo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Birmingham and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across New Delhi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Port Moresby and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Chengdu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Chicago and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Osaka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave

exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Guadalajara and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Hyderabad and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities

specialize. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Giza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Trujillo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Sheffield and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Birmingham and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

heatwave exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Cape Coast and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Dunedin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across León and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Madang and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map storm surge exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Buenos Aires and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across La Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Edinburgh and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Fukuoka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Toulouse and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Manchester and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Guadalajara and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A

planner might map flood exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Port Said and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Bristol and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Shanghai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Shanghai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Nairobi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Melbourne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Christchurch and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Cardiff and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Adelaide and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner

might map storm surge exposure across Adelaide and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Adelaide and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Eldoret and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across London and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Guadalajara and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Fukuoka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Kolkata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Beijing and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Toronto and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought

exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Cape Coast and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Puebla and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Hamburg and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Marseille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Port Said and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Salvador and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood

exposure across Nakuru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Rio de Janeiro and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Alexandria and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Applied note: A planner might map landslide exposure across Birmingham and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Trujillo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Bengaluru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Kimbe and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Dunedin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Auckland and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

earthquake exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Giza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Fortaleza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Cape Coast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Suez and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map landslide exposure across Mendoza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Toronto and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Chicago and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across New Delhi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Nagoya and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Applied note: A planner might map heatwave exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Port Moresby and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Brisbane and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Kimbe and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Bengaluru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Nairobi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave

exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Chengdu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Chiclayo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Buenos Aires and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Edinburgh and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Beijing and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Fortaleza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner

might map heatwave exposure across Mar del Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Fukuoka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Chennai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Cologne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Puebla and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Cologne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Lima and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Edinburgh and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Osaka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tamale and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood

exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Goroka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Dunedin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Sapporo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Beijing and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Madang and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Trujillo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood

exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Nice and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Berlin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Tijuana and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Lille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Stuttgart and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

flood exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Lille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Ottawa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Osaka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Chiclayo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Houston and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide

exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Nagoya and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Houston and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nakuru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied

note: A planner might map drought exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Vancouver and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Chennai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across La Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Leeds and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Cusco and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Adelaide and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

heatwave exposure across Nice and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Mumbai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Stuttgart and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Lima and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Chennai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Sapporo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Kolkata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Munich and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave

exposure across Toulouse and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across La Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Kolkata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Cardiff and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across New York and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Rosario and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Nagoya and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map

earthquake exposure across Fukuoka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Manchester and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Salvador and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Nairobi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Mendoza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Belo Horizonte and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Iquitos and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Leeds and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Montreal and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Leeds and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm

surge exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Mar del Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Nagoya and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Takoradi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across La Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Takoradi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Hyderabad and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chennai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Los Angeles and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note:

A planner might map earthquake exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Dunedin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Munich and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Stuttgart and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Lima and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Shenzhen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Lyon and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Brisbane and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide

exposure across Toronto and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Madang and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mar del Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Frankfurt and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Liverpool and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Nakuru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

earthquake exposure across Yokohama and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Perth and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Nice and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Accra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Stuttgart and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Cusco and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tauranga and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Houston and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Christchurch and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Perth and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map flood exposure across Glasgow and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Nice and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Chennai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Bengaluru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Kumasi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chiclayo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Washington, D.C. and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave

exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Christchurch and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Toulouse and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Hyderabad and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Hamburg and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across León and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Canberra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Los Angeles and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave

exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tema and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Melbourne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Montreal and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Frankfurt and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Buenos Aires and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Paris and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Cardiff and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Iquitos and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A

planner might map heatwave exposure across Fortaleza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Kimbe and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Mombasa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Melbourne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Guadalajara and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Suez and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Giza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map storm surge exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lyon and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Bengaluru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Toronto and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Guadalajara and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across New Delhi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across La Plata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Christchurch and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Guadalajara and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map earthquake exposure across Mombasa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Luxor and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Guadalajara and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Fukuoka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Buenos Aires and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood

exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Luxor and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space.

Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across New York and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Chennai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Kisumu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide

exposure across Calgary and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Vancouver and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Guangzhou and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Birmingham and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Bristol and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Shanghai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Luxor and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought

exposure across Arequipa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Nakuru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Los Angeles and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Paris and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Arequipa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Hamburg and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across São Paulo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map heatwave exposure across Vancouver and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Beijing and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Houston and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Sapporo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Goroka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities

specialize. Applied note: A planner might map drought exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Cusco and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mar del Plata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Ottawa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Auckland and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Chengdu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Berlin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Liverpool and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Shenzhen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A

planner might map drought exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Frankfurt and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Stuttgart and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Chiclayo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Washington, D.C. and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

landslide exposure across Nagoya and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Rosario and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across New Delhi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Birmingham and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Auckland and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Cardiff and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across New York and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Birmingham and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Rio de Janeiro and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note:

A planner might map heatwave exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Sheffield and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Hyderabad and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Tema and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Mexico City and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Edinburgh and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave

exposure across Trujillo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mendoza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Bristol and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Alexandria and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Shanghai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Berlin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A

planner might map earthquake exposure across Brisbane and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Salvador and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Kisumu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Belfast and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across São Paulo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Wellington and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Toronto and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Hamburg and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Trujillo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Kimbe and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Toulouse and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Frankfurt and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

flood exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Malindi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Mombasa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Edmonton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Cape Coast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across São Paulo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Cusco and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might

map flood exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Chengdu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Los Angeles and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Luxor and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across León and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Salvador and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Mombasa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Lyon and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Wellington and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Fortaleza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought

exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Brisbane and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Edmonton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Chicago and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Bengaluru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Lyon and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Fortaleza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Rosario and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mendoza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Arequipa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

landslide exposure across Kolkata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Kimbe and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Los Angeles and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Los Angeles and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Marseille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Birmingham and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Phoenix and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Hamburg and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

landslide exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Montreal and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Edinburgh and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Mumbai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Lae and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Munich and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Mumbai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map storm surge exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Trujillo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Adelaide and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Melbourne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Monterrey and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Nagoya and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Cusco and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Lyon and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Wuhan and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Dunedin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Mexico City and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Cardiff and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Trujillo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map earthquake exposure across Dunedin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Frankfurt and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Canberra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Melbourne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Brisbane and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Guangzhou and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Hamburg and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities

specialize. Applied note: A planner might map drought exposure across Córdoba and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Guangzhou and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Shenzhen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Montreal and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Chengdu and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Giza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across León and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map

landslide exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Cusco and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across New York and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Port Said and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across São Paulo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Applied note: A planner might map earthquake exposure across Leeds and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Kimbe and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Iquitos and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Los Angeles and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Lyon and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Toulouse and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Dunedin and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Rosario and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A

planner might map heatwave exposure across Houston and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Eldoret and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Canberra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Tijuana and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Leeds and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across New Delhi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Fukuoka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood

exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Accra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Guadalajara and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Chiclayo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Marseille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Lyon and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm

surge exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Edinburgh and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Cologne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Toronto and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Chicago and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Christchurch and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner

might map earthquake exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Lyon and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Houston and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Cairo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Nagoya and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Mombasa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Port Moresby and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Córdoba and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Lille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Liverpool and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Alexandria and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might

map landslide exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Nagoya and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lille and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Cardiff and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Madang and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Puebla and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Phoenix and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Puebla and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Tokyo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought

exposure across Wuhan and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Kimbe and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Tema and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Osaka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Toulouse and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across New York and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Giza and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood

exposure across Accra and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Giza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Vancouver and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Takoradi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Guangzhou and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Suez and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Eldoret and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Frankfurt and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Toronto and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Kolkata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner

might map earthquake exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Stuttgart and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Nairobi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Lille and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Chengdu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Monterrey and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mount Hagen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Fortaleza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chiclayo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Cusco and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Birmingham and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Nagoya and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities

specialize. Applied note: A planner might map flood exposure across La Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Tema and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Tijuana and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Chicago and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Salvador and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Tauranga and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Kimbe and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Paris and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Mendoza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied

note: A planner might map drought exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Yokohama and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Mombasa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Wellington and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Montreal and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Houston and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kimbe and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Tauranga and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map earthquake exposure across Lae and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Lille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Luxor and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Accra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Shanghai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Guadalajara and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Alexandria and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Tauranga and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Belfast and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Tema and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Edinburgh and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood

exposure across Kolkata and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Dunedin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Eldoret and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Cairo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Mombasa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Chennai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Port Said and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

drought exposure across Ottawa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Frankfurt and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Rio de Janeiro and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Nagoya and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Trujillo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Cusco and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Frankfurt and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Yokohama and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map drought exposure across Manchester and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Wellington and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Phoenix and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Shanghai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Tauranga and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Trujillo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Nairobi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Guadalajara and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Mexico City and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

flood exposure across Kolkata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Luxor and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Calgary and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Eldoret and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space.

Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Kolkata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Berlin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Buenos Aires and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Cologne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Mendoza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Cape Coast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Stuttgart and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Lima and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Brasília and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

earthquake exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Shanghai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Los Angeles and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Sydney and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Sapporo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Edinburgh and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Mar del Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Puebla and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map storm surge exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Berlin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Birmingham and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Cusco and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Toronto and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map

earthquake exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Hamburg and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Cairo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Shenzhen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Wuhan and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Luxor and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Chengdu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Suez and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Wuhan and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Port Moresby and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Cardiff and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Hamilton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might

map earthquake exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Osaka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Beijing and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Nice and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Tauranga and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Christchurch and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Bristol and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Guangzhou and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide

exposure across Nice and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Puebla and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Córdoba and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Wellington and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Munich and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Mexico City and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Kolkata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Munich and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Marseille and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Birmingham and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map storm surge exposure across Manchester and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Accra and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Tamale and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Salvador and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Montreal and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Cologne and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Melbourne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Hamilton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Nakuru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Buenos Aires and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Liverpool and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nagoya and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought

exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Chengdu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Calgary and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Mendoza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Cape Coast and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Bristol and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Mount Hagen and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Kolkata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Rosario and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Liverpool and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Kimbe and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note:

A planner might map landslide exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Manchester and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Alexandria and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Sydney and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Toronto and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Perth and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Hamburg and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Houston and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Port Said and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities

specialize. Applied note: A planner might map drought exposure across León and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Ottawa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Malindi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Christchurch and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Chiclayo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Nairobi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Hamburg and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Salvador and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might

map earthquake exposure across Vancouver and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Kumasi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Eldoret and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Toronto and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Accra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across London and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Melbourne and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

earthquake exposure across Yokohama and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Christchurch and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Brasília and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Shanghai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Suez and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Bristol and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Cusco and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Melbourne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities

specialize. Applied note: A planner might map earthquake exposure across Los Angeles and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mombasa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Yokohama and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Shanghai and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Accra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Houston and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Fortaleza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across La Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Osaka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Perth and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Kumasi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note:

A planner might map landslide exposure across Lae and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Nairobi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mendoza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Montreal and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Bengaluru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Port Moresby and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note:

A planner might map landslide exposure across Belo Horizonte and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Montreal and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Salvador and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across La Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Kumasi and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Shenzhen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Guadalajara and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across León and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Mendoza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Arequipa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Hamilton and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Trujillo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Edmonton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map drought exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Rosario and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Kolkata and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Chiclayo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Port Moresby and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Hyderabad and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Takoradi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Fortaleza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Phoenix and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Port Said and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

flood exposure across Cusco and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Marseille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Tokyo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Washington, D.C. and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Phoenix and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Sydney and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Goroka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Los Angeles and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Bengaluru and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Toulouse and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied

note: A planner might map flood exposure across Monterrey and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Tauranga and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Nagoya and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Auckland and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Rosario and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across La Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Marseille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Puebla and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Cusco and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Salvador and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Shenzhen and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Auckland and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map heatwave exposure across Ottawa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Brisbane and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Sydney and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Birmingham and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Brisbane and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Malindi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Córdoba and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Arequipa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Alexandria and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Bristol and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A

planner might map storm surge exposure across Wellington and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Goroka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Hyderabad and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Nakuru and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Auckland and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Kisumu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Port Moresby and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Houston and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Beijing and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

earthquake exposure across Cairo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Lae and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Stuttgart and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Yokohama and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Perth and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Iquitos and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Nice and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Hamilton and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Lima and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Christchurch and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood

exposure across Lille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across La Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Tokyo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Chennai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Edmonton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Marseille and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Sapporo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Chicago and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Cardiff and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Osaka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Iquitos and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Alexandria and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner

might map heatwave exposure across Bristol and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Hamilton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Rio de Janeiro and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Mumbai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Kumasi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across New Delhi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Chicago and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Wellington and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Nagoya and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Birmingham and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Lae and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Cairo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Chennai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood

exposure across Nice and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Lyon and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Hyderabad and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Tamale and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method

focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Chiclayo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Paris and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Chiclayo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Kumasi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Luxor and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Hyderabad and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map

heatwave exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Toronto and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Manchester and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Arequipa and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Hamburg and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Giza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across São Paulo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Edinburgh and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Mexico City and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across New Delhi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Accra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Edinburgh and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Kisumu and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought

exposure across Tamale and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Dunedin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Vancouver and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Christchurch and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Chicago and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Edmonton and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nakuru and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Lima and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Belo Horizonte and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Lae and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tema and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Monterrey and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity.

Applied note: A planner might map storm surge exposure across La Plata and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Brasília and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Lima and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Chengdu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Sapporo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Mumbai and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Berlin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Hyderabad and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Salvador and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Perth and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Arequipa and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mar del Plata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Fortaleza and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought

exposure across Osaka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Chennai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across León and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Shenzhen and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Beijing and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Port Said and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Fukuoka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Sheffield and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Port Said and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Bengaluru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mount Hagen and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Madang and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Monterrey and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture.

Applied note: A planner might map drought exposure across Rio de Janeiro and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Takoradi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Iquitos and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Guangzhou and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Tamale and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Tokyo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Buenos Aires and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Mexico City and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Bengaluru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Munich and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note:

A planner might map storm surge exposure across Brisbane and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mexico City and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Buenos Aires and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Tijuana and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Port Moresby and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Lyon and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Goroka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Edmonton and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Mexico City and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across New York and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Canberra and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake

exposure across Kolkata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Toronto and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Mumbai and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Ottawa and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Puebla and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across León and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Marseille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Calgary and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Tamale and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Belo Horizonte and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought

exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Córdoba and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Canberra and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Lae and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Trujillo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Kisumu and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Shanghai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Cairo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Canberra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Berlin and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Nakuru and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide

exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Suez and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Munich and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Fukuoka and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Stuttgart and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Port Moresby and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Kisumu and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Mendoza and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Brisbane and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Stuttgart and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Lyon and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Toronto and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Nagoya

and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Mendoza and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Monterrey and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map storm surge exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Nairobi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space.

Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Bengaluru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Shanghai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Chicago and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Belo Horizonte and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Glasgow and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Goroka and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Adelaide and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake

exposure across Nakuru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Hamilton and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Ottawa and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map heatwave exposure across Tauranga and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Malindi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Brasília and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Edinburgh and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Takoradi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Tokyo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Shenzhen and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Sheffield and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Sydney and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Ottawa and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought

exposure across Sapporo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Cologne and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Kumasi and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across São Paulo and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Tokyo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across London and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Dunedin and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Ottawa and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Wellington and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Lille and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Shanghai and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Wuhan and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Bengaluru and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Iquitos and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner

might map flood exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Port Moresby and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across New York and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Lyon and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Paris and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Hyderabad and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Shanghai and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Mar del Plata and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Trujillo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Giza and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Rosario and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Liverpool and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A

planner might map heatwave exposure across Phoenix and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Suez and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Kumasi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Montreal and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map landslide exposure across Cape Coast and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they

analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map drought exposure across Cologne and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Dunedin and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Hyderabad and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Chiclayo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Tauranga and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Accra and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Córdoba and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map

drought exposure across Tokyo and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Nakuru and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Christchurch and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Eldoret and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Fukuoka and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Lille and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Alexandria and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Paris and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Rio de Janeiro and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Goroka and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Wuhan and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Trujillo and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Cardiff and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map heatwave exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied

note: A planner might map heatwave exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Kumasi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map flood exposure across Salvador and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Frankfurt and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map earthquake exposure across Dunedin and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Washington, D.C. and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Mumbai and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Accra and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Cusco and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Adelaide and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map flood exposure across Kimbe and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Kenya). Capital city Nairobi and major centers such as Mombasa, Kisumu, Nakuru illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Malindi and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map drought exposure across Sapporo and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood

exposure across Montreal and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Kolkata and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Lae and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Calgary and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Houston and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Adelaide and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map heatwave exposure across Edmonton and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Yokohama and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map landslide exposure across Birmingham and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map earthquake exposure across Osaka and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Glasgow and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map heatwave exposure across Washington, D.C. and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map heatwave exposure across Guadalajara and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Peru). Capital city Lima and major centers such as Arequipa, Cusco, Trujillo illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map

storm surge exposure across Iquitos and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across São Paulo and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Houston and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Luxor and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Mexico City and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Christchurch and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Kumasi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map heatwave exposure across Tijuana and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map drought exposure across Melbourne and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — Japan). Capital city Tokyo and major centers such as Osaka, Yokohama, Nagoya illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map earthquake exposure across Nagoya and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Dunedin and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Kumasi and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Argentina). Capital city Buenos Aires and major centers such as Córdoba, Rosario, Mendoza illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets.

Applied note: A planner might map earthquake exposure across Mar del Plata and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map earthquake exposure across Leeds and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Glasgow and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map storm surge exposure across Leeds and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Phoenix and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze

migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Suez and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map flood exposure across Giza and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Luxor and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — United States). Capital city Washington, D.C. and major centers such as New York, Los Angeles, Chicago illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Scale affects interpretation: patterns can appear clustered at a neighborhood scale but diffuse at a national scale. Applied note: A planner might map storm surge exposure across Phoenix and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map flood exposure across Frankfurt and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Mexico). Capital city Mexico City and major centers such as Guadalajara, Monterrey, Puebla illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Puebla and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Accessibility combines distance, travel time, cost, and network connectivity; it strongly predicts economic opportunity. Applied note: A planner might map storm surge exposure across Belo Horizonte and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Cape Coast and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Wuhan and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — India). Capital city New Delhi and major centers such as Mumbai, Bengaluru, Kolkata illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map

drought exposure across New Delhi and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map landslide exposure across Mount Hagen and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — United Kingdom). Capital city London and major centers such as Birmingham, Manchester, Glasgow illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Birmingham and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Madang and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Cairo and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography

perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Adelaide and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map storm surge exposure across Chengdu and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — France). Capital city Paris and major centers such as Marseille, Lyon, Toulouse illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Urban systems form hierarchies: capitals often host governance and high-order services, while secondary cities specialize. Applied note: A planner might map landslide exposure across Toulouse and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map flood exposure across Chengdu and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (North America — Canada). Capital city Ottawa and major centers such as Toronto, Montreal, Vancouver illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Calgary and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — New Zealand). Capital city Wellington and major centers such as Auckland, Christchurch, Hamilton illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Auckland and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Egypt). Capital city Cairo and major centers such as Alexandria, Giza, Port Said illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map drought exposure across Alexandria and test how green infrastructure changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Africa — Ghana). Capital city Accra and major centers such as Kumasi, Tamale, Takoradi illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map flood exposure across Takoradi and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map drought exposure across Sydney and test how transit-oriented development changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Asia — China). Capital city Beijing and major centers such as Shanghai, Shenzhen, Guangzhou illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Physical processes—erosion, deposition, glaciation, tectonics—shape landforms and hazard exposure. Applied note: A planner might map landslide exposure across Wuhan and test how transit-oriented development changes expected losses. A

geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Fieldwork and surveys contextualize model outputs, capturing lived experience and local knowledge. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Sydney and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Australia). Capital city Canberra and major centers such as Sydney, Melbourne, Brisbane illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map landslide exposure across Melbourne and test how building-code enforcement changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Europe — Germany). Capital city Berlin and major centers such as Hamburg, Munich, Cologne illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: GIS overlays land use, elevation, flood zones, and population to evaluate risk and plan interventions. Concept focus: Spatial inequality can be studied through service access, housing affordability, exposure to hazards, and labor markets. Applied note: A planner might map storm surge exposure across Frankfurt and test how early warning systems changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (Australia & Oceania — Papua New Guinea). Capital city Port Moresby and major centers such as Lae, Mount Hagen, Madang illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across metropolitan space. Method focus: Remote sensing compares images through time to quantify deforestation, urban expansion, and drought stress. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map drought exposure across Goroka and test how risk-informed zoning changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.

Extended note (South America — Brazil). Capital city Brasília and major centers such as São Paulo, Rio de Janeiro, Salvador illustrate urban hierarchy and functional specialization. From a physical geography perspective, researchers examine how climate variability and landforms influence water supply, hazard exposure, and ecosystem services. From a human geography perspective, they analyze migration, housing markets, and employment accessibility across

metropolitan space. Method focus: Spatial statistics detect clustering, hot spots, and diffusion patterns to support evidence-based planning. Concept focus: Climate drivers such as monsoons, ocean currents, and altitude gradients influence water availability and agriculture. Applied note: A planner might map earthquake exposure across Rio de Janeiro and test how water-demand management changes expected losses. A geographer would then interpret results using uncertainty bounds and qualitative insight from local stakeholders.