Advanced Geography Notes - Grade 9

June 7, 2024

Contents

Unit 1: Geological History and Topography of Ethiopia

1.1 Geography: Meaning, Scope, and Branches

Geography is the scientific study of the Earth that describes and analyses spatial and temporal variations of physical, biological and human phenomena, and their interrelationships and dynamism over the surface of the Earth.

Scope of Geography refers to the broad range of subjects geography studies, including:

- The Earth, its position in the universe, and its movements.
- Physical features of the Earth's surface, their causes, and changes over time.
- Relationships between humans and their natural environment.
- Atmospheric conditions, weather, and climate.
- The composition of the Earth and its diverse landforms.
- Major economic activities and their environmental impacts.

Branches of Geography:

1. **Physical Geography** studies the distribution and interactions of the Earth's natural features:
    - Climate
    - Landforms
    - Soil
    - Vegetation
    - Drainage Systems
    - Water Resources
    - Animals
2. **Human Geography** studies the distribution and influence of human aspects of the world:
    - Cultures
    - Population Settlement
    - Economic Activities
    - Political Systems

1.2 Location, Size, and Shape of Ethiopia

Absolute Location of Ethiopia is expressed in terms of latitude and longitude:
* Ethiopia is located between **3°N – 15°N latitudes**and **33°E– 48°E longitudes**

Relative Location of Ethiopia:
* **Vicinal Location:** Ethiopia is a landlocked country surrounded by six neighboring countries:

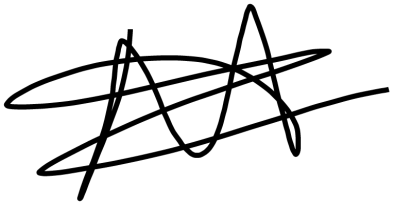
- Djibouti (310 km boundary)
- Eritrea (840 km boundary)
- Kenya (760 km boundary)
- Somalia (1,600 km boundary)
- Sudan (744 km boundary)
- South Sudan (1,006 km boundary)

* **Strategic Location:** Ethiopia is located:

- In northeastern (Horn) Africa.
- To the southwest of the Asian continent.
- In the Nile Basin.
- To the south of Europe.
- To the northwest of the Indian Ocean.
- To the southwest of the Red Sea.
- To the south of the Mediterranean Sea.

Size of Ethiopia:
* Ethiopia is the **tenth largest country in Africa**with a total area of **1,106,000 square kilometers** * Its large size contributes to:

- Diverse agro-ecological zones and a wide variety of fauna and flora.
- A large amount of arable land.
- A great variety of mineral resources.



- A diverse population of ethnic groups.

* Its large size also presents challenges, including:

- Expensive administrative expenditure.
- The need for a large army to protect its sovereignty.
- Challenges in constructing infrastructure and socio-economic integration.

Shape of Ethiopia:

* Ethiopia has a more or less **compact (circular) shape** * Its shape is considered **compact**because the extreme north-south and east-west spans are comparable. **Compactness Ratios**(examples):

- Boundary-Circumference Ratio (B/C): B/C of Ethiopia is 1.411. This value implies a deviation of 41% from a perfectly circular shape.
- Area-Boundary Ratio (A/B): This ratio suggests that for every 1km of boundary, there are 210km2 of land within the country.
- Actual Area-Area of Inscribing Circle (A/A'): This ratio indicates the degree of compactness with 1 representing a perfect circle.

* The compact shape provides militaristic advantages.

1.3 Geological History of Ethiopia

Geological Time Scale is a system used to divide Earth's history into different eras, periods, and epochs:

* **Eras** are the largest divisions of geological time, characterized by changes in life forms. * **Periods** are subdivisions of eras. * **Epochs** are subdivisions of periods.

Major Geological Eras in Ethiopia:

1. **Precambrian Era (4.5 billion years to 600 million years ago):**
   - Orogenic movements (mountain building).
   - Intensive volcanic activities.
   - Denudation (wearing down of mountains).
   - Formation of folded mountains.
   - Emergence of first forms of life (single-celled organisms).

- Formation of the oldest rock - crystalline basement/basement complex rock.

* Outcrops of basement complex rocks are found in central and northern Tigray, Mettekel, Assossa, Illubabor, the Abbay Gorge, central Sidama, southern Omo, southern Bale, Borena, and central, western, and northern Eritrea.

2. **Paleozoic Era (600 million years to 250 million years ago):**

   - Denudation and peneplanation (erosion leading to flat plains).
   - No significant structural formation.
   - Formation of inselbergs (isolated rocky hills).

   * The Paleozoic Era is known for the predominance of invertebrates.

3. **Mesozoic Era (250 million years to 70 million years ago):**

   - Epeirogenesis (uplifting and sinking of the landmass).
   - Formation of sedimentary rocks.
   - **Triassic Period:** Transgression (sea advancing onto land) led to the formation of Adigrat sandstone.
   - **Jurassic Period:** Continued transgression led to the formation of Hintalo limestone.
   - **Cretaceous Period:** Regression (sea receding from land) led to the formation of Upper Sandstone.

   * The Mesozoic Era is known for the predominance of reptiles, including dinosaurs.

4. **Cenozoic Era (70 million years to the recent time):**

   - Continued uplifting from the Cretaceous Period.
   - Formation of the Great East African Rift Valley System.
   - **Tertiary Period:** Extensive volcanic activity leading to the formation of the Northwestern Highlands, Southeastern Highlands, and Somali plateaus.
   - **Quaternary Period:** Recent volcanic activity, formation of the Afar Horst, and Pluvial rainfall deposition in the lowlands.

   * The Quaternary Period is considered the period in which modern humans evolved.

1.3.2 Landforms of Ethiopia

Landform refers to individual earth surface features.

The landforms of Ethiopia are characterized by a diversity of:

* Highlands * Plateaus * Ambas (small arable lands) * Rugged Mountains * Deep River Gorges * Lowlands

Relief of Ethiopia, based on geological and structural features, is divided into three main physiographic divisions:

1. **The Western Highlands and Associated Lowlands:**
   - Stretches from Tigray in the north to Gamo and Goffa in the southwest.
   - Makes up 44% of Ethiopia's area.
   - Source of major rivers like the Abbay, Baro, and Tekezze.
   - Subdivisions:
     - The Plateau of Tigray (Mount Tsibet, Mount Ambalage, Mount Assimba)
     - The North Central Massif (Gondar, Gojjam, Wollo, Mount Ras Dashen, Mount Legeda, Mount Analu, Mount Tefaw Lezer, Mount Kolo, Mount Guna, Mount Abuna Yoseph, Mount Hey)
     - The Plateau of Shewa (Mount Abbuye Meda, Mount Guraghe)
     - The Southwestern Highlands (Gamo-Konso Highlands, Maji-Korma Highlands, Dawuro-Konta Highlands, Tullu Wallel, Benishangul mountain, Mount Gughe)
2. **The Southeastern Highlands and Associated Lowlands:**
   - Located southeast of the Rift Valley.
   - Subdivisions:
     - Hararghe Plateaus (Mount Gara Muletta, Mount Jebel Tita)
     - Arsi Plateau (Mount Chillallo, Mount Bada, Mount Kaka)
     - Bale Massif (Mount Tulu Dimtu, Mount Batu)
     - Sidama Highlands
3. **The Rift Valley:**
   - Stretches from the Afar Depression in the north to Lake Turkana and Chew Bahir in the south.
   - Covers 18% of Ethiopia's area.

- Subdivisions:
  - The Afar Triangle (Dallol Depression, grabens, cinder cones, volcanic mountains, salt plains, Lake Assale, Lake Afrera)
  - The Main Ethiopian Rift or the Lakes Region (numerous lakes)
  - The Chew-Bahir Rift (Omo-Gibe trough, Sagan and Woito streams, Ganjuli and Galena Valleys)

Unit 2: Climate of Ethiopia

2.1 Meaning of Weather and Climate

Weather refers to the condition of the atmosphere at a particular time and place, including factors like temperature, rainfall, pressure, wind, moisture, cloud cover, and humidity. It can change rapidly from hour to hour or day to day.

Climate is the long-term pattern of weather conditions in a specific region, taking into account trends, fluctuations, and variations over time and space. It is generally more consistent than weather.

2.2 Elements of Weather and Climate

- **Precipitation:** Any liquid or frozen water that forms in the atmosphere and falls back to Earth (rain, sleet, hail, snow).
- **Temperature:** The degree of hotness or coldness of an object.
- **Humidity:** The concentration of water vapor present in the air.
- **Air Pressure:** The force exerted on a surface by the air above it due to gravity.
- **Wind:** The movement of air caused by uneven heating of the Earth and its rotation.
- **Sunshine:** Direct sunlight exposure to a given area.
- **Cloud Cover:** Any visible mass of water droplets or ice crystals suspended in the atmosphere.

2.3 Controls of Weather and Climate in Ethiopia

1. **Latitude:** The angular location of a place relative to the direct rays of the sun. * Ethiopia's tropical location leads to:
    - High temperatures throughout the year.
    - High daily (diurnal) temperature ranges.
    - Relatively small annual temperature ranges.
    - Minimal difference between summer and winter in daylight hours.
2. **Altitude:** The main factor determining spatial temperature distribution in Ethiopia. * As altitude increases, temperature decreases. * Example: Bako (1,800 m), Addis Ababa (2,200 m), Awash (916 m) all at 9°N.
3. **Mountain Barriers:** Exert influence on rainfall distribution. * **Windward Side:** The side facing the wind laden with moisture. * **Leeward Side** (Rain Shadow): The side opposite the windward side, receiving less rain.
4. **Revolution of the Earth and Inclination of Axis:** The Earth's 23.5° tilt creates seasons. * During Northern Hemisphere winter, Ethiopia experiences the "Bega" season with clear skies, high daytime temperatures, and low nighttime temperatures.
5. **Distance from the Sea:** Water bodies have a moderating effect on climate, but this is limited in Ethiopia's interior.
6. **Ocean Currents:** Warm and cold currents affect coastal climates, but their impact in Ethiopia is inconsequential.

2.4 Climatic Regions and Seasonal Variations in Ethiopia

Agro-climatic Zones in Ethiopia are defined based on altitude and temperature:

1. **Wurch/Kur (Alpine or Afro-Alpine):** * Altitude: 3,300 meters and above. * Mean Annual Temperature: < 10°C. * Locations: Very high mountains in South Gondar, Wollo, Shewa, Arsi, and Bale.
2. **Dega (Temperate):** * Altitude: 2,300 – 3,300 meters. * Mean Annual Temperature: 10 – 15°C. * Historically a center of human settlement due to secure locations, reliable rainfall, and absence of tropical diseases.
3. **Woina Dega (Subtropical):** * Altitude: 1,500 – 2,300 meters. * Mean Annual Temperature: 15 – 20°C. * Contains most of Ethiopia's agricultural land.

4. **Kolla (Tropical):** * Altitude: 500 – 1,500 meters. * Mean Annual Temperature: 20 – 30°C. * Hot lowlands with variable rainfall.

5. **Bereha (Desert):** * Altitude: Below 500 meters. * Mean Annual Temperature: $<$ 30°C. * Hot arid lowlands with very low rainfall.

Seasonal Variations in Ethiopia:
* **Temperature:**

- High temperatures from March to June.
- Low temperatures from November to February.

* **Rainfall:** * **Spatial Variation** is determined by the Inter-Tropical Convergence Zone (ITCZ) and prevailing wind systems. * **Temporal Variation:**

- **Kiremt (Summer):** June to August (main rainy season).
- **Belg (Spring):** March to May (main rainy season).
- **Meher (Autumn):** September to November (less intense rainfall).
- **Bega (Winter):** December to February (dry season, except for some rain in Afar lowlands).

* **Rainfall Regions of Ethiopia:**

(a) Year-round Rainfall Region (wet in most months): Southwestern Highlands.

(b) Summer Rainfall Region: Northwest Highlands and Western Lowlands.

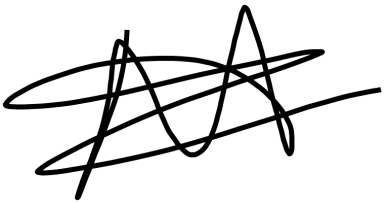
(c) Autumn-and-Spring Rainfall Region: Southeastern Highlands and Lowlands.

(d) Winter Rainfall Region: Eastern Escarpment, Middle Rift Valley, Afar.

(e) Merged Spring, Summer, and Autumn Rainfall Region: Western foothills of the Southeastern Highlands.

2.5 Measurements of Weather and Climate

Instruments for Measuring Weather and Climate Elements:
* **Thermometer:** Measures temperature. * **Rain Gauge:** Measures rainfall. * **Barometer:** Measures air pressure. * **Anemometer:** Measures wind speed. * **Wind Vane:** Indicates wind direction.
Calculating Mean Daily, Monthly, Annual Temperature and Rainfall:



Mean Daily Temperature: (Maximum Daily Temperature + Minimum Daily Temperature) / 2 **Mean Monthly Temperature:** Sum of daily averages / Number of days in the month **Mean Annual Temperature:** Sum of mean monthly temperatures / 12 **Annual Range of Temperature:** Temperature of the hottest month - Temperature of the coldest month **Mean Monthly Rainfall:** Sum of daily rainfall / Number of days in the month **Total Annual Rainfall:** Sum of monthly rainfall **Mean Annual Rainfall:** Sum of annual rainfall (over 30-35 years) / Number of years

Unit 3: Natural Resource Base of Ethiopia

3.1 Meaning of Natural Resources

Natural Resources are natural assets occurring in nature that can be used for economic production or consumption.

Classification of Natural Resources:

* **Renewable Resources:** Resources that can be replenished by nature (plants, animals, soil, water, geothermal energy, wind energy, solar radiation). * **Non-renewable Resources:** Resources that cannot be regenerated by nature and exist in limited amounts (minerals, coal, crude oil, natural gas).

3.2 Drainage Systems of Ethiopia

Drainage System refers to the flow direction and destination of rivers. Ethiopia's drainage systems are influenced by geological events, particularly those in the Cenozoic Era.

1. **Western (Mediterranean Sea) Drainage System:** * The largest drainage system in terms of catchment area and water volume. * Contributes 60% of Ethiopia's annual water discharge. * Major Rivers:

   - Tekezze (drains Lasta, Gondar/Semein, Tigray)
   - Abbay (originates in Gojjam, flows through Lake Tana, separates Gondar from Gojjam and Gojjam from Shewa)
   - Baro-Akobo (drains the wettest southwestern highlands)

   * These rivers join the Nile in Sudan and flow to the Mediterranean Sea.

2. **Southeastern (Indian Ocean) Drainage System:** * The second largest drainage system. * Contributes 32% of Ethiopia's annual water flow. * Major Rivers:

- Genale (originates in Hararghe, Sidamo, Bale, and Arsi, flows to the Indian Ocean through Somalia)
- Wabe Shebelle (the longest river in Ethiopia, originates in Hararghe, does not reach the Indian Ocean, ends in Somalia)

3. **Inland (Rift Valley) Drainage System:** * The smallest drainage system. * Consists of numerous lakes and smaller streams. * Major Rivers:

   - Awash (rises near Ginchi, flows through the Rift Valley, terminates in Lake Abbe on the Djibouti border)
   - Omo-Gibe (drains the southwestern highlands, flows into Lake Turkana)

3.3 Water Resources of Ethiopia

Water Resources are crucial for Ethiopia's economy and development. Ethiopia is known as the "Water Tower of Northeastern Africa" due to its abundant water resources.

3.3 Water Resources of Ethiopia

Water Resources are crucial for Ethiopia's economy and development. Ethiopia is known as the "Water Tower of Northeastern Africa" due to its abundant water resources.

1. **Major Rivers and Their Characteristics:** * Refer to Table 3.1 for details on major rivers, their catchment areas, lengths, and major tributaries.

2. **Lakes of Ethiopia:** * **Highland Lakes:** Found on plateaus, often formed by volcanic craters or lava dams.

   - Crater Lakes: Haik (near Dessie), Hashenge (near Korum), Bishoftu, Kuriftu, Babbo Gaya, Arsedi, Wonchi, Dendi, Ginchi, Wellisso, Ziquala.
   - Watershed Lakes: Lake Tana (formed by a lava dam).

   * **Rift Valley Lakes:** Clustered along the floor of the Rift Valley, formed by tectonic activity.

   - Lake Tana, Lake Abbaya, Lake Chamo, Lake Ziway/Danbal, Lake Shalla, Lake Langano, Lake Hawassa, Lake Abijatta (refer to Table 3.2 for details on depth, area, and location).

3. **Significance of Ethiopian Rivers and Lakes:** * Hydroelectric Power (HEP) Generation:

- Gilgel Gibbe 1, 2, and 3 HEP plants (Gibe River).
- Awash 1, 2, and 3 HEP projects (Awash River).
- Fincha HEP project (Fincha River).
- Tekezze HEP plant (Tekezze River).
- Melka Wakena HEP (Wabe Shebelle River).
- Koysha HEP plant (under construction).
- Great Ethiopian Renaissance Dam (under construction).

* Fishery: Major sources of fish (Lake Chamo, Lake Abbaya, Lake Tana, River Baro). * Irrigation Schemes: River Awash is most utilized for irrigation due to its flat plains. * Navigation: River Baro is the only navigable river, and lakes Tana, Ziway, and Abbaya are important inland waterways. * Tourism and Recreation: Scenic beauty attracts tourists and provides recreational opportunities.

3.4 Major Soils Types of Ethiopia

Soil is the loose material overlying the Earth's crust, consisting of water, air, organic and inorganic minerals.

Formation of Soils in Ethiopia:

* **Parent Material:** The type of rock from which the soil is derived. * **Climate:** Influences weathering and decomposition processes. * **Vegetation Cover:** Adds humus to the soil. * **Topography:** Influences soil depth due to erosion.

Major Soil Types in Ethiopia:

1. **Nithosols (Red Basaltic Soils):** * Cover 12% of Ethiopia. * Associated with high rainfall and formerly forested areas. * Found in the Western Highlands (Wollega, Kafa, Illubabor), Southern Highlands (Sidama), Central and Western Highlands (Shewa), Highlands of Gojjam, and Eastern Highlands (Hararghe). * Matured soils with deep profiles, leached of soluble minerals but rich in iron and aluminum. * Suitable for farming, especially for coffee, enset, and cereals.

2. **Vertisols (Black Basaltic Soils):** * Cover 10% of Ethiopia. * High clay content, sticky, and difficult to drain. * Found in Arsi, Bale, and central Hararghe. * Good nutrient content but poor drainage makes them unsuitable for grazing.

3. **Cambisols:** * Young and shallow soils developed from recent lava deposits of the Quaternary Period. * Found on rugged and sloping terrain (eastern escarpment of Shewa and Chercher Highlands).

4. **Regosols:** * Shallow and young, but coarse-textured. * Low agricultural value. * Found in the Danakil and Ogaden plains.

5. **Xerosols:** * Young and shallow, found in arid and semi-arid regions. * Weakly developed profile, high salt content, and humus deficiencies. * Limited agricultural value except for irrigated areas.

6. **Luvisols:** * Well-developed in areas with wet and dry seasons and minimal leaching. * Good chemical nutrients, intensively cultivated, except on steep slopes or waterlogged areas. * Found around Lake Tana, the eastern part of the North Central Highlands, and the Southern Lowlands.

7. **Lithosols:** * Similar to Cambisols and Regosols, poorly matured and found on steep slopes. * Found in areas of low precipitation, covering escarpments of the Northeastern and Chercher Highlands.

8. **Fluvisols:** * Transported soils deposited by rivers, seas, and lakes. * Cover 10% of Ethiopia. * Good agricultural potential. * Found extensively in the lower regions of the Omo, Awash, Abbay, and Baro-Akobo rivers.

3.5 Major Mineral Resources and Their Distribution in Ethiopia

Ethiopia has many untapped mineral deposits.

Metallic Minerals:

1. **Gold:** Extracted since ancient times from alluvial deposits and volcanic veins in Precambrian rocks. * Major gold mines: Adola, Bule Hora, Arero, Moyale, Akobo, Lega Dembi, Sakaro, Tigray regions.

2. **Platinum:** Key input for electronic manufacturing. * Deposits: Western Ethiopia (northeast of Yubdo, north of Gimbi, Akobo area of Gambella).

3. **Tantalum:** Used in electronics manufacturing. * Deposits: Kenticha (southeast of Shakiso in Adola), other areas in Adola.

Non-metallic Minerals:

1. **Potash and Salt:** Found in the Danakil Depression (Dallol).

2. **Soda Ash:** Found in Rift Valley lakes (Abijata, Shalla).

3. **Limestone:** Used for building, construction, cement, and chalk production. * Reserves: Tigray, Shewa, Harerghe.

4. **Clay:** Used for pottery and brick industries.

5. **Silica:** Used in glass manufacturing. * Reserves: Harer, Shewa, Gondar, Gojjam, Sidamo, Arsi, Tigray, Wollega.

6. **Crude Oil and Natural Gas:** Believed to be found in the Ogaden basin.

7. **Coal:** Lignite coal deposits are found in Shewa (Debre Brihan-Dessie road, Sululta, near Mojo), Sidama, and Wollega.

3.6 Biotic Resources of Ethiopia

Biotic Resources are living organisms in an ecosystem, classified into producers (plants), consumers (animals), and decomposers (bacteria and fungi).

Major Types of Natural Vegetation in Ethiopia:

1. **Afro-alpine and Sub-Afro-alpine:** High mountain vegetation similar to European Alpine vegetation. * Altitude: Above 3,300 meters (Afro-alpine), 3,000 – 3,300 meters (Sub-Afro-alpine). * Vegetation: Tussock grasslands, serules, mosses, lichens, Gibra (Lobelia rhynchopetalum), Asta (Erica arborea). * Locations: Semein and Bale Highlands.

2. **Forests:** * Altitude: 450 – 3,300 meters. * Rainfall: 200 – 2,200 mm. * Types:

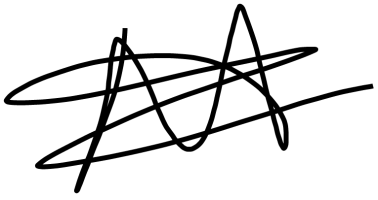
   - Highland Forests: Kerkha (Arundinarial), Tid (Juniperous Procera), Zigba (Podocarpus), Woira (Oliia Africana), Kosso (Hagenia Abbyssinia).
   - Lowland Forests (Gallery/Riverine): Sholla, Warka, Baphia.

3. **Savanna Woodland:** * Altitude: 250 – 2,300 meters. * Rainfall: 200 – 1,400 mm. * Vegetation: Grass mixed with scattered trees, shrubs, and bushes. * Types:

   - Juniperious woodlands
   - Accacia woodlands
   - Mixed deciduous woodlands

4. **Semi-desert and Desert Vegetation:** * Rainfall: Below 600 mm. * Vegetation: Xerophytes (drought-resistant plants) - short acacia, thorn bushes, succulent plants, rough grasses. * Locations: Afar lowlands, Northwestern and Southeastern Lowlands (Ogaden lowlands).

Main Kinds of Wildlife in Ethiopia:



1. **Common Wild Animals:** Hyenas, jackals.
2. **Game Animals:** Found in grasslands, including herbivores (giraffes, wild asses, zebras) and carnivores (lions, leopards, cheetahs).
3. **Arboreals (Tree Animals):** Colobus monkey, apes, baboons, found in rainforest regions.
4. **Aquatic Animals:** Hippopotamus, fish, crocodiles, found in lakes and rivers.
5. **Birds:** Endemic and migratory birds, such as fish eagles, pelicans, geese, Abyssinian Ground Hornbill, flamingoes, found in rift valley sanctuaries and forests.
6. **Endemic Animals:** Found only in Ethiopia, many endangered:
   - Walia Ibex (wild goat)
   - Mountain Nyala (Dega Agazon)
   - Gelada or Chilada baboon
   - Menilik's Bushbuk (Dikula)
   - Swayne's Hartebeest (Korkay)
   - Semein Fox (Key Kebero)
   - Wild Ass (Yedur Ahiya)

Unit 4: Population and Demographic Characteristics of Ethiopia

4.1 Concept of Human Population

Human Population refers to the total number of people living in a specified area at a given time.

Importance of Studying Human Population:

* Population dynamics (changes over time and space) have significant impacts on socio-economic development. * Population characteristics influence policy decisions in areas like healthcare, education, housing, and social security. * Understanding population helps to adjust situations to existing realities.

Population Geography is a branch of geography that focuses on the spatial analysis of human population and its relationships with the environment.

4.2 Trends of Population Growth in Ethiopia

* Ethiopia is the **second most populous country in Africa**and the **12th most populous in the world** * In **2020**, its population was estimated at **114.9 million**, with a growth rate of **2.6%** * Ethiopia has experienced **rapid population growth**since the 1950s, with a significant decline in mortality rates due to improved healthcare. **Doubling Time:** The time it takes for a population to double in size has been decreasing, reflecting the rapid growth.

4.3 Population Composition

Population Composition refers to the characteristics of a population based on factors like age, sex, marital status, family size, economic activities, nationality, language, and religion.

1. **Age Structure:** * The distribution of a population across different age groups. * **Age Groups:** 0-4, 5-9, 10-14, ..., 60-64, 65+, or broader groups like 0-14 (young dependents), 15-64 (working age), 65+ (elderly dependents). * **Population Pyramids** are graphic representations of age and sex distributions.

    - Triangular pyramid: Characteristic of developing countries with high birth rates and high mortality.
    - Rectangular pyramid: Characteristic of developed countries with low birth rates and low mortality.

    * **Age Dependency Ratio (ADR):** The ratio of dependents (young and old) to the working-age population. * Formula: (Population aged 0-14 + Population aged 65+) / Population aged 15-64. * Ethiopia has a high ADR, indicating a significant burden on the working population.

2. **Sex Structure:** * The ratio of males to females in a population. * **Sex Ratio** is expressed as the number of males per 100 females. * Formula: (Number of males / Number of females) x 100. * Ethiopia has a slightly higher proportion of males than females.

4.4 Population Distribution

Population Distribution refers to how population spreads out over a given area.
* **Population Density:** The average number of people per unit area (usually square kilometer). * Formula: Total Population / Total Area. * **Uneven Population Distribution in Ethiopia:** * The highlands have higher population

concentrations due to moderate climate, fertile soil, adequate rainfall, and lack of tropical diseases. * The lowlands are sparsely populated due to high temperatures, low rainfall, and prevalence of tropical diseases like malaria. **Population Density by Region:** Refer to Table 4.2 for population density data by administrative region. **Factors Affecting Population Distribution:**

1. **Physical Factors:**
    - Climate (rainfall, temperature)
    - Soil Fertility
    - Natural Water Supply
    - Relief (slope, altitude)
    - Vegetation Cover
2. **Human Factors:**
    - Types of Economic Activity (agriculture, pastoralism, industry)
    - Historical Patterns of Population Movement (migration, resettlement)

4.5 Urban and Rural Settlement Patterns

Settlement refers to the grouping of people into occupancy units, along with their residences and supporting infrastructure.

1. **Rural Settlements:** * Located in areas far from urban centers. * Dominated by isolated homesteads. * Inhabitants are primarily engaged in agriculture. * Types:
    - **Permanent Settlements:** Located in the highlands, often associated with crop farming.
        - **Scattered (Dispersed) Settlements:** Homesteads separated by long distances.
        - **Grouped (Nucleated) Settlements:** Homesteads concentrated in one place. * The Derg regime's villagization program aimed to create grouped settlements. * The current government promotes voluntary villagization programs and resettlement programs.
    - **Temporary Settlements:** Mobile settlements inhabited by nomadic pastoralists in lowlands (rift valley and western, eastern, and southern lowlands).

2. **Urban Settlements:** * Larger and more compact than rural settlements. * Dominated by non-agricultural economic activities. * Include cities and towns. * Centers of civilization, serving political, educational, social, and economic functions. * **Criteria for Urban Status in Ethiopia:**

   - Minimum population of 2,000.
   - Two-thirds of the population engaged in non-agricultural activities.
   - Chartered municipality.
   - Presence of social services and amenities.

   * **Urbanization:** The process of urban growth and development. * In Ethiopia, urbanization is a relatively recent phenomenon.

4.6 Health and Disease in the Highlands and Lowlands of Ethiopia

Health Status in Ethiopia:

* Ethiopia has made significant progress in improving health indicators, such as increased life expectancy and decreased mortality rates (neonatal, infant, under-five, and maternal). * The **Health Extension Program (HEP)**has expanded access to public health interventions. * However, Ethiopia still faces a heavy burden of disease, particularly preventable communicable diseases and nutritional disorders.

Root Causes of Poor Health Status in Ethiopia:

1. **Lack of Access to Clean Water:** Rivers and lakes are major water sources, but often unsafe.
2. **Lack of Adequate Nutrition:** Malnutrition is widespread, with about half of children under five affected.
3. **Disease-related Beliefs, Behaviors, and Practices:** Female Genital Mutilation (FGM) and early marriage contribute to poor health.
4. **Lack of Health Services:** Underfunding and limited healthcare access, particularly in rural areas.

Major Killer Diseases in Ethiopia:

* Prenatal-maternal conditions * Acute respiratory infection * Malaria * Nutritional deficiencies (children under five) * Diarrhea * AIDS * Tuberculosis

Health Workforce Shortages:

* Ethiopia has a low ratio of healthcare professionals per population (0.04 doctors, 0.43 nurses, 0.05 midwives per 1,000 people). * The government is working to address this by training health extension workers and midwives.

Health and Disease in the Highlands vs. Lowlands:

* **Highlands:** * Generally better health outcomes due to lower prevalence of tropical diseases. * **Lowlands:** * More susceptible to tropical diseases like malaria and yellow fever.

4.7 Impacts of Population Growth on Sustainable Development in Ethiopia

Rapid Population Growth in Ethiopia poses significant challenges for sustainable development.

1. **Population Growth and Environmental Degradation:**
    - **Deforestation:** Increased demand for fuelwood, construction materials, and agricultural land leads to forest clearing.
    - **Pollution:** Overcrowding in urban areas leads to increased pollution from households, industries, and transportation. Agricultural pollutants also contribute.
    - **Land/Soil Degradation:** Deforestation, overgrazing, and poor agricultural practices accelerate soil erosion, leading to decreased productivity and desertification.
2. **Population Growth and Food Production:**
    - Ethiopian agriculture is largely dependent on subsistence farming, which is vulnerable to rainfall variability and lacks access to modern technologies.
    - The growing population puts pressure on land resources, leading to land degradation and decreased food production.
    - Widespread malnutrition, particularly among children.
3. **Population Growth and Fuelwood Consumption:**
    - Fuelwood is a major energy source in Ethiopia, but deforestation has led to a shortage.
    - Increased demand for fuelwood, construction materials, and fodder.
4. **Population Growth and the Provision of Social Services:**

- **Education:** Increased demand for education, but limited resources result in overcrowded classrooms and limited access.
- **Healthcare:** The growing population puts strain on healthcare systems, leading to limited access and coverage, especially in rural areas.

4.8 Language and Religious Diversity in Ethiopia

Language Diversity in Ethiopia:

* Over 80 languages are spoken in Ethiopia. * The Ethiopian languages belong to two superfamilies:

1. **Afro-Asiatic Superfamily:**
   - **Cushitic Family:** Oromo (Afaan Oromoo), Somali (Af-Somali), Sidama (Sidaamu Afo), Afar (Qafaraf), Kembata (Kambatissa), Hadiya (Hadiyissa), Halaba (Halabissa), Gedeo (Gedeoffa).
   - **Semitic Family:** Amhara (Amarigna), Tigray (Tigrigna), Gurage (Guragigna), Adere (Aderigna), Argoba (Argobigna).
   - **Omotic Family:** Wolaita (Wolaitatto), Dawuro (Dawurootsuwa), Kafa (Kafi noono), Konta (Kontaatsuwa).
2. **Nilo-Saharan Superfamily:** Kunama, Beiji, Gumuz, Mao, Kewam, Nuer, Annuak.

Religious Diversity in Ethiopia:

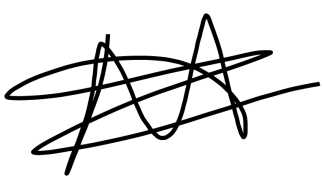
* According to the 2007 census:

- Orthodox Christianity: 43.5%
- Islam: 33.9%
- Protestantism: 18.6%
- Catholicism: 0.7%
- Others: 3.2%

Unit 5: Major Economic and Cultural Activities in Ethiopia

5.1 Major Economic Activities in Ethiopia

Economic Activity is the production, distribution, and exchange of goods and services.



Classification of Economic Activities:

1. **Primary Economic Activities:** Involve the direct extraction of resources from the environment.
    - Agriculture: Crop production and livestock raising.
    - Forestry: Extraction of forest products.
    - Fishing: Catching and harvesting fish.
    - Mining: Extraction of minerals.
2. **Secondary Economic Activities:** Involve processing raw materials into finished goods.
    - Manufacturing: Production of goods in factories.
    - Construction: Building structures.
    - Power Production: Generation of electricity.
3. **Tertiary Economic Activities:** Involve the provision of services.
    - Trade: Buying and selling of goods.
    - Transportation: Movement of goods and people.
    - Tourism: Travel and hospitality services.
    - Healthcare: Medical services.
    - Education: Educational services.
4. **Quaternary Economic Activities:** Involve specialized knowledge and skills, often involving research and development.
    - Research
    - Finance
    - Government
5. **Quinary Economic Activities:** Highest level of decision-making and specialized skills.
    - Top-level business executives
    - Government officials
    - Research scientists

5.2 Contribution of Subsistence Farming and Cash Crop to the Ethiopian Economy

Agriculture is the mainstay of the Ethiopian economy, providing employment and income for the majority of the population.

1. **Subsistence Farming:** * Production of food for the farmer's own consumption, with limited surplus for sale. * Types:

   - Crop Production: Cereals (teff, wheat, barley, sorghum), enset, pulses, oilseeds.
   - Livestock Raising: Cattle, goats, sheep, camels, poultry, pack animals.

   * Contribution to the Ethiopian Economy:

   - Reduces vulnerability of rural households.
   - Improves livelihoods.

2. **Cash Crop Production:** * Production of crops for sale, generating income. * Types: Coffee, oilseeds, pulses, chat, sugarcane, cotton, fruits. * Contribution to the Ethiopian Economy:

   - Source of food and raw materials.
   - Source of capital (agricultural taxation, export earnings).
   - Provides employment opportunities.

5.3 Problems of Agriculture in Ethiopia

1. **Land Degradation:** Soil erosion due to topography, rainfall, and human activities (deforestation, overgrazing, poor cultivation practices). * Soil loss estimated at 1.9 billion tons annually.
2. **Variable Rainfall:** Unreliable rainfall makes agricultural production vulnerable.
3. **Fragmentation of Farm Plots and Small Size of Holdings:** Inheritance patterns and population growth lead to smaller and more fragmented landholdings.
4. **Backward Technology:** Reliance on traditional tools and farming practices.
5. **Poor Rural Infrastructure:** Limited irrigation, transportation, electricity, and agricultural markets.

5.4 Trade and Transport in Ethiopia

Trade is the buying and selling of goods and services.

1. **Types of Trade in Ethiopia:** * **Domestic (Internal) Trade:** Exchange of goods and services within the country. * **Foreign (External) Trade:** Exchange of commodities between different countries.

2. **Structure of Export and Import Trade:** * **Export Trade:** Ethiopia exports raw materials (coffee, oilseeds, flower, chat, pulses, gold, textile products) and some manufactured goods. * **Import Trade:** Ethiopia imports finished products (machinery, transport equipment, electronics, fuel). * **Trade Balance:** Ethiopia has a trade deficit (imports exceed exports).

Transportation in Ethiopia:
* **Traditional Modes:** Pack animals (donkeys, mules), human porterage. * **Modern Modes:**

1. **Road Transport:** The most important mode, providing access to rural and urban areas. * Road Network: Over 138,000 km, including federal, rural, woreda, and urban roads.

2. **Railway Transport:** * Ethio-Djibouti Railway (standard gauge, 752.7 km, Addis Ababa to Djibouti) * Addis Ababa Light Rail Transit (AA-LRT) (first light rail in Eastern and Sub-Saharan Africa)

3. **Inland Waterways:** Limited use due to rugged topography and seasonal rainfall. * River Baro is the only navigable river.

4. **Air Transport:** Ethiopian Airlines is the leading airline in Africa, providing domestic and international services.

5.5 Road Safety in Ethiopia

Road Safety involves making roads safe for all road users, including vehicles, cyclists, and pedestrians.

Road Traffic Accidents in Ethiopia:
* Road traffic accidents are a major public health concern, causing significant fatalities and injuries. * The number of road traffic deaths has increased dramatically in recent years. * The majority of victims are passengers and pedestrians.

Factors Influencing Road Accidents:
* Vehicle-related factors (mechanical failure) * Road-related factors (road conditions) * Road user-related factors (driver distraction, impairment, speeding) * Environmental-related factors (weather conditions)

Consequences of Road Traffic Accidents:

* Loss of productivity * Legal costs * Pain and suffering * Loss of quality of life

Road Safety Rules:

* For Pedestrians:

- Walk on sidewalks when available.
- Cross at designated areas.
- Obey signs and signals.
- Wear reflective clothing at night.

* For Drivers:

- Never drink and drive.
- Always wear seat belts.
- Maintain a safe distance from other vehicles.
- Avoid distractions while driving.
- Obey traffic signals.
- Drive within speed limits.
- Be aware of other drivers.

5.6 Cultural Landscapes and Tourism in Ethiopia

Cultural Landscape:

* A geographic area that is associated with a historic event, activity, or person, or that exhibits cultural or aesthetic values. * Represents the combined works of nature and humans. * Example: **Konso Cultural Landscape** (southern Ethiopia, characterized by dry stone terrace agriculture and walled settlements).

Tourism in Ethiopia:

* Tourism is an important economic activity, creating job opportunities and generating income. * **Tourist Attractions:**

- **Natural Attractions:**
  - Simien Mountains National Park
  - Bale Mountains National Park

  - Awash National Park
  - NechSar National Park
  - Omo National Park
  - The Blue Nile Falls (Tis Isat Falls)
  - Mago National Park
  - Lake Tana
  - Gambella National Park
  - The Sof Omar Cave
  - Abijata-Shalla National Park
  - The Rift Valley

- **Human-made Attractions:**
  - Lalibela
  - Harar
  - Axum
  - Gondar Castle
  - Tiya

Unit 6: Human-Natural Environment Interactions in Ethiopia

6.1 Human-Environment Relationship

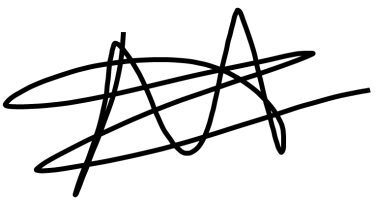
Environment refers to the physical surroundings and characteristics of the place we live, including land, sea, and atmosphere.

Human-Environment Interaction:

* **Dependence:** Humans rely on the environment for resources like food, water, energy, and materials. * **Modification:** Human activities often alter the environment, with both positive and negative consequences. * **Adaptation:** Humans adapt to their environment, developing technologies and practices to survive in different climates and conditions.

Human Activities and the Environment:

1. **Use of Natural Resources:**



- **Forest Resources:** Deforestation for agriculture, fuel, and construction materials can lead to biodiversity loss, soil erosion, and impacts on water supply.
- **Energy Resources:** Renewable energy sources (hydropower, wind, solar) are increasingly important to reduce reliance on non-renewable fossil fuels.
- **Water Resources:** Water is essential for domestic, agricultural, and industrial use, but overuse can lead to water stress and scarcity.

2. **Production of Waste and Pollutants:**

- Human activities generate waste that can pollute air, water, and soil, impacting human health and ecosystems.
- Examples: Industrial waste, agricultural waste, sewage, air pollution.

6.2 Optimum Population and Resource Use

Optimum Population: A population size where the available resources are sufficient to meet the needs of the population, leading to a high quality of life.

* **Characteristics of Optimum Population:**

- High average living standards.
- Full employment.
- Rational resource development.
- Balanced demographic structure.

* The optimum population size varies depending on factors like economic diversity, geography, social structure, technology, and communication infrastructure.

6.3 Overpopulation and Resource Use

Overpopulation: A condition where the population exceeds the carrying capacity of its environment, leading to insufficient resources and a lower quality of life.

* **Causes of Overpopulation:**

- High birth rates
- Declining mortality rates
- Immigration

- Lack of education
- Poverty
- Poor contraceptive use

* **Effects of Overpopulation:**

- Resource depletion
- Water shortages
- Pollution (air, water, soil)
- Deforestation and biodiversity loss
- Climate change
- Loss of arable land
- Desertification
- Migration
- Hunger, malnutrition
- Low life expectancy
- Crime
- Conflict over resources
- Strain on infrastructure
- Increased land prices

6.4 Underpopulation and Resource Use

Underpopulation: A condition where the population is too small to fully utilize available resources.

* **Causes of Underpopulation:**

- Low birth rates
- High mortality rates
- Emigration

- Lack of economic opportunities

* **Impacts of Underpopulation on Resource Use:** * **Positive Impacts:** Reduced resource depletion and environmental impacts. * **Negative Impacts:** Decline in resource production, aging population, workforce shortages, lower tax revenues.

6.5 Impacts of Rapid Population Growth

Rapid Population Growth has significant environmental and socioeconomic impacts.

1. **Deforestation:** * Causes: Demand for fuelwood, construction materials, and agricultural land. * Consequences: Biodiversity loss, soil erosion, decreased rainfall, shortages of wood supply, loss of scenic beauty.

2. **Pollution:** * Causes: Increased waste from households, industries, transportation, and agriculture. * Consequences: Air and water pollution, health problems, climate change.

3. **Land/Soil Degradation:** * Causes: Deforestation, overgrazing, poor agricultural practices. * Consequences: Soil erosion, loss of soil fertility, reduced agricultural productivity, desertification.

Unit 7: Contemporary Geographic Issues and Public Concerns in Ethiopia

7.1 Natural Resource Degradation

Natural Resource Degradation is a process of deterioration of the quality and quantity of natural resources.

1. **Soil Degradation:** * **Causes:**

   - **Natural Factors:** Topography, rainfall intensity, soil type, vegetation cover.
   - **Human-made Factors:** Deforestation, overgrazing, poor cultivation practices (over-cropping, over-cultivation, slash and burn).

   * **Effects:** Soil erosion, loss of fertility, decreased productivity. * **Conservation Measures:**

- Reforestation
- Afforestation
- Terracing
- Strip cultivation
- Controlling livestock populations
- Intercropping
- Contour plowing
- Check dams
- Shelter-belts and windbreaks.

2. **Vegetation Degradation:** * **Causes:** Deforestation (demand for fuelwood, construction materials, agricultural expansion, slash and burn, overgrazing, forest fires). * **Mitigation Measures:**

   - Conservation measures (reforestation, afforestation, controlled burning, agroforestry, alternative energy sources, controlling overgrazing, population control).
   - Capacity building and institutional development (environmental education, forest-related curricula, supporting community forests, enforcing laws).

3. **Water Degradation:** * **Causes:** Drought, pollution from sewage, organic waste, fertilizers, increased demand for potable water. * **Conservation Measures:**

   - Protection of watershed forests, wetlands, and key ecosystems.
   - Rehabilitation and protection of natural ecosystems.
   - Environmental impact assessment for dams and irrigation schemes.
   - Protection of water-body interfaces (shores, banks, wetlands).
   - Community participation in water resource management.
   - Wastewater recycling.
   - Artificial recharging of ground and surface water.
   - Improved water management techniques.
   - Private sector involvement in water resource development.

7.2 The Ethiopian "Green Legacy" Movement

The "Green Legacy" Initiative:

* Launched in 2019 by Ethiopian Prime Minister Abiy Ahmed. * A tree planting campaign to address climate change and deforestation. * Aims to plant 20 billion seedlings over four years (2020-2023). * Includes agroforestry, forest sector development, urban greening, water and soil management. * Aligned with international commitments such as the Paris Climate Change Agreement and the Sustainable Development Goals (UN).

Goals of the Green Legacy Movement:

- Curbing the effects of climate change and deforestation.
- Increasing agricultural productivity.
- Improving food security.
- Preventing environmental conflicts.
- Battling desertification and soil erosion.
- Building a climate-resilient green economy.
- Ensuring gender equality.

Unit 8: Geographic Inquiry Skills and Techniques

8.1 Map and its Basic Components

Map is a simplified, diminished, plain representation of the Earth's surface as viewed vertically from above.

Historical Development of Maps:

1. **Traditional Map-making:** Simple sketches used for navigation and communication. * Early materials included sticks, shells, clay tablets, parchment, paper, and silver plates. * Often relied on observation and hand-drawn measurements.
2. **Modern Map-making:** Based on scientific principles and advanced technology. * Uses aerial photography, satellite imagery, and computers. * Emphasizes accuracy and detailed representations.

Uses of Maps:

* **Location:** Identifies the exact site of a place and its position relative to other areas. * **Distance:** Measures distances between places using the map scale. * **Area:** Calculates the size of a place using the scale. * **Direction:** Determines the direction and bearing of a place using compass points and bearings.

Basic Components of a Map:

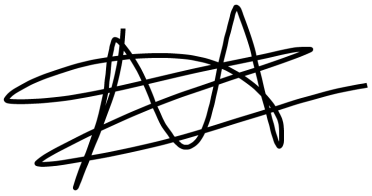
- **Title:** Describes the subject, location, and possibly the time period of the map.
- **Scale:** Represents the relationship between distances on the map and the corresponding distances on the ground.
- **Direction Arrow (North Arrow):** Indicates the north direction on the map.
- **Grid Reference:** Provides a coordinate system (latitude and longitude, or national grid references) for locating points on the map.
- **Legend/Key:** Explains the symbols and conventions used on the map.
- **Date/Year of Publication:** Indicates when the map was published.
- **Place of Publication and Publisher:** Identifies the organization that published the map.
- **Magnetic Declination (Variation):** The difference between true north and magnetic north.
- **Compass:** A device used to determine direction.

8.2 Scale, Scale Conversion, and Measurements on Maps

Scale is the ratio or proportion between distances on the map and the corresponding distances on the ground.

Types of Map Scales:

1. **Large Scale Maps:** Show smaller areas with greater detail. * Scale: 1:50,000.
2. **Medium Scale Maps:** Show medium-sized areas with moderate detail. * Scale: 1:50,000 – 1:250,000.
3. **Small Scale Maps:** Show larger areas with less detail. * Scale: 1:250,000.



Ways of Expressing Map Scale:

1. **Scale Statement:** Expressed in words (e.g., 1 centimeter to 1 kilometer).
2. **Representative Fraction (RF):** Expressed as a ratio (e.g., 1:50,000).
3. **Graphic Scale (Linear Scale):** A line drawn on the map, divided into units representing distances.

Scale Conversion:
* Changing one form of scale to another. * **RF to Scale Statement:** Divide the denominator of the RF by 100,000 (1 km = 100,000 cm). * **Scale Statement to RF:** Convert the ground distance to centimeters and express the ratio.
Measurements on Maps:

1. **Measurement of Distance:** * **Map Distance (MD):** Measured using a ruler in centimeters. * **Ground Distance (GD):** Calculated using the scale. * Formula: GD = MD x Scale. * Types of Distance:
   - **Straight-line Distance (Air Distance):** Measured along a straight line on the map.
   - **Curved-line Distance:** Measured along roads, railways, rivers, etc.
2. **Measurement of Area:** * **Regular Shapes:** Squares, rectangles, triangles, circles (use geometric formulas to calculate area). * **Irregular Shapes:** Use instruments like planimeters or methods like the grid square method.

8.3 Position on Maps

Geographic Grid System:
* Uses a network of lines (parallels and meridians) to locate points on the Earth's surface. * **Latitude:** Angular distance north or south of the equator (0°). * **Longitude:** Angular distance east or west of the Prime Meridian (0°). * **National Grid References:**

- Uses a grid system with eastings (vertical lines) and northings (horizontal lines).
- **Four-digit grid reference:** Locates a point within a 10km square.
- **Six-digit grid reference:** Provides a more accurate location within a 1km square.

Compass Direction:

* **Cardinal Points:** North (N), East (E), South (S), West (W). * **Subsidiary (Intermediate) Points:** North-North-East (NNE), East-North-East (ENE), etc. * **Bearings:** Measured in degrees from north, increasing clockwise.

North Points:

* **True North (Geographic North):** The direction from any point on Earth's surface to the North Pole. * **Magnetic North:** The direction a compass needle points. * **Grid North:** The direction of north-south grid lines on a map.

8.4 Map Sketching

Sketch Map: A freehand drawing of a region, showing its main features without precise measurements.

Steps for Drawing a Sketch Map:

1. Determine the area to be sketched. 2. Consider the scale and space needed. 3. Determine the orientation (north direction). 4. Select reference points. 5. Decide on the level of detail. 6. Sketch general shapes. 7. Add details (names, land features).

8.5 Interpreting Maps and Graphs

Interpreting Features on Maps:

* Map makers use symbols and conventional signs to represent features on maps. * The **Legend/Key** explains the meaning of these symbols.

Interpreting Graphs, Tables, and Diagrams:

1. **Simple Line Graphs:** Use lines to show changes over time or relationships between two variables.

2. **Simple Bar Graphs:** Use horizontal or vertical bars to represent different amounts or values.

3. **Pie Charts:** Use segments of a circle to show the sizes of parts in relation to a whole.

Join telegram channel
https://t.me/grade9to12ethiopia