UNIVERSITY OF WINCHESTER

Environment & Development

Local and Global Issues.

Tristan Berchoux

STRUCTURE

DEVELOPMENT OF SOCIETIES

THE TRAGEDY OF THE COMMONS

ECOSYSTEM SERVICES

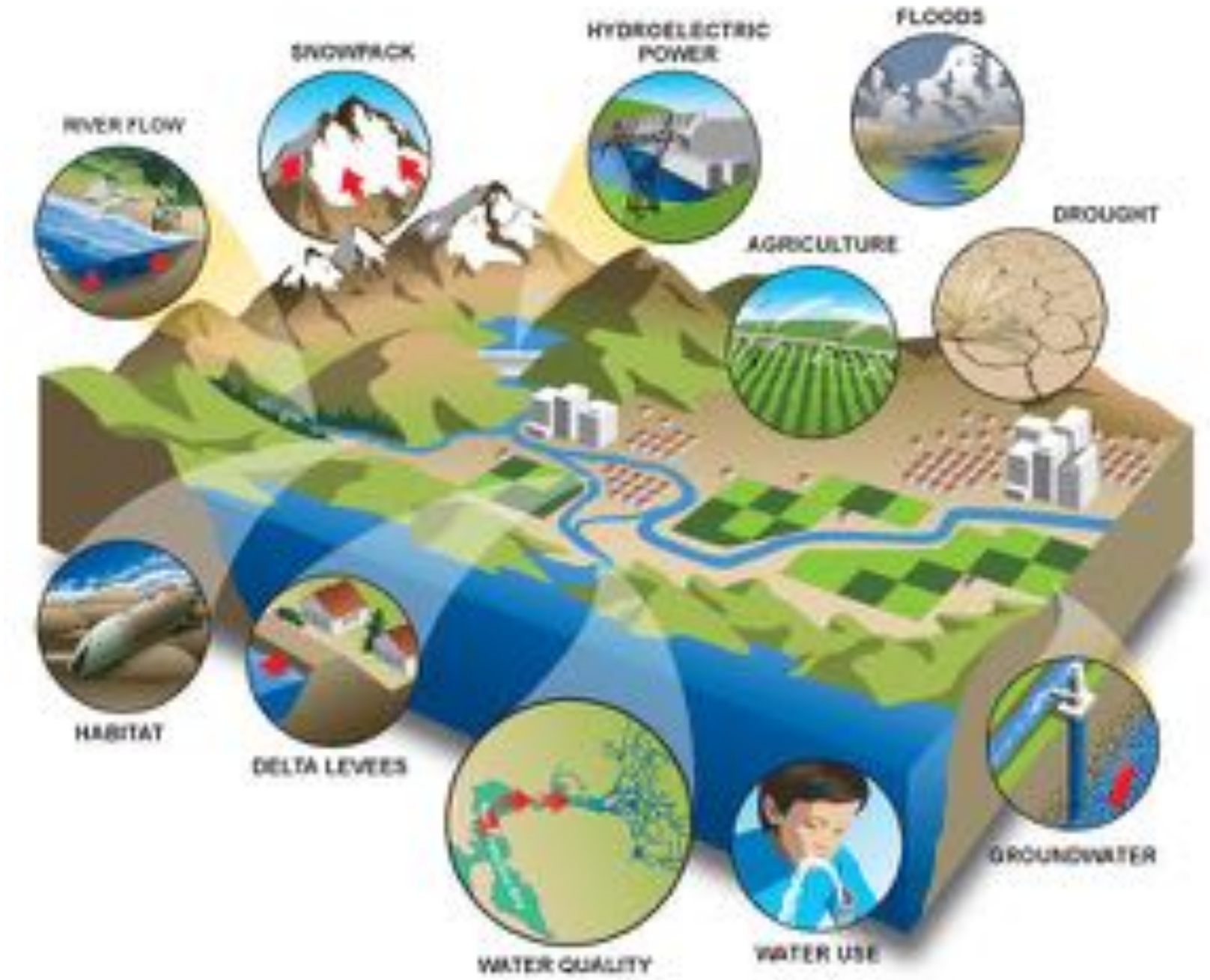
CONCEPTUAL FRAMEWORKS

CASE STUDY

PRACTICAL

INTRODUCTION

INTRODUCTION



PART 1 – DEVELOPMENT OF SOCIETIES

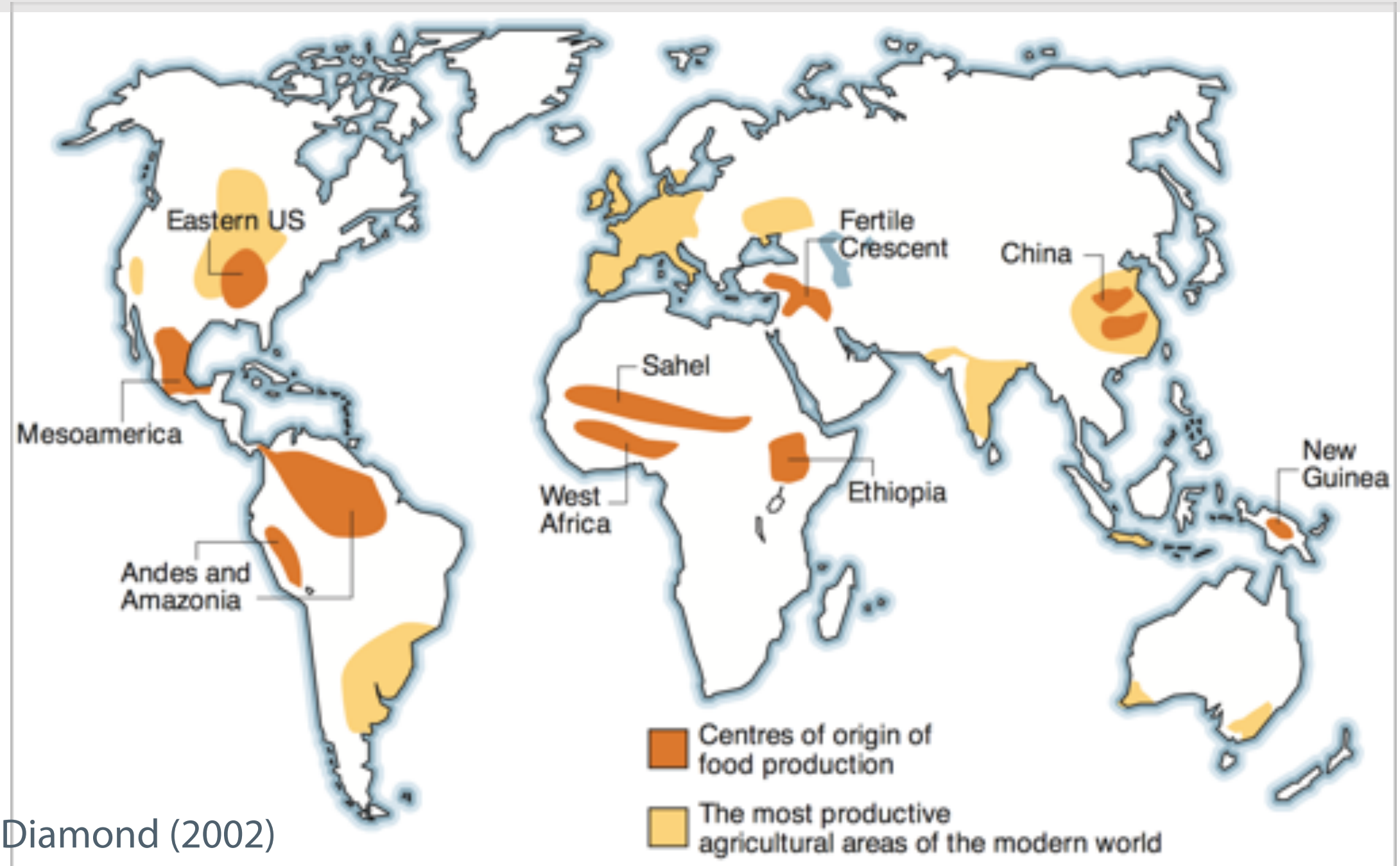
Why did the rate of progress differ so much for cultures on different continents?

From hunter-gatherers to food producers

- **11,000 years ago:** 5 million people (100% hunter-gatherers)
- **5,000 years ago:** 50 million people (90% farmers)

- **Farming and cattle breeding**
  - Social stability
  - Labor specialisation
- **Decision-making**
  - Decline in availability of wild game, prestige, and cultural attitudes
  - Availability of domesticable wild plants and animals, technologies
  - Population pressures from growth

DISTRIBUTION OF PLANTS AND ANIMALS



Jared Diamond (2002)

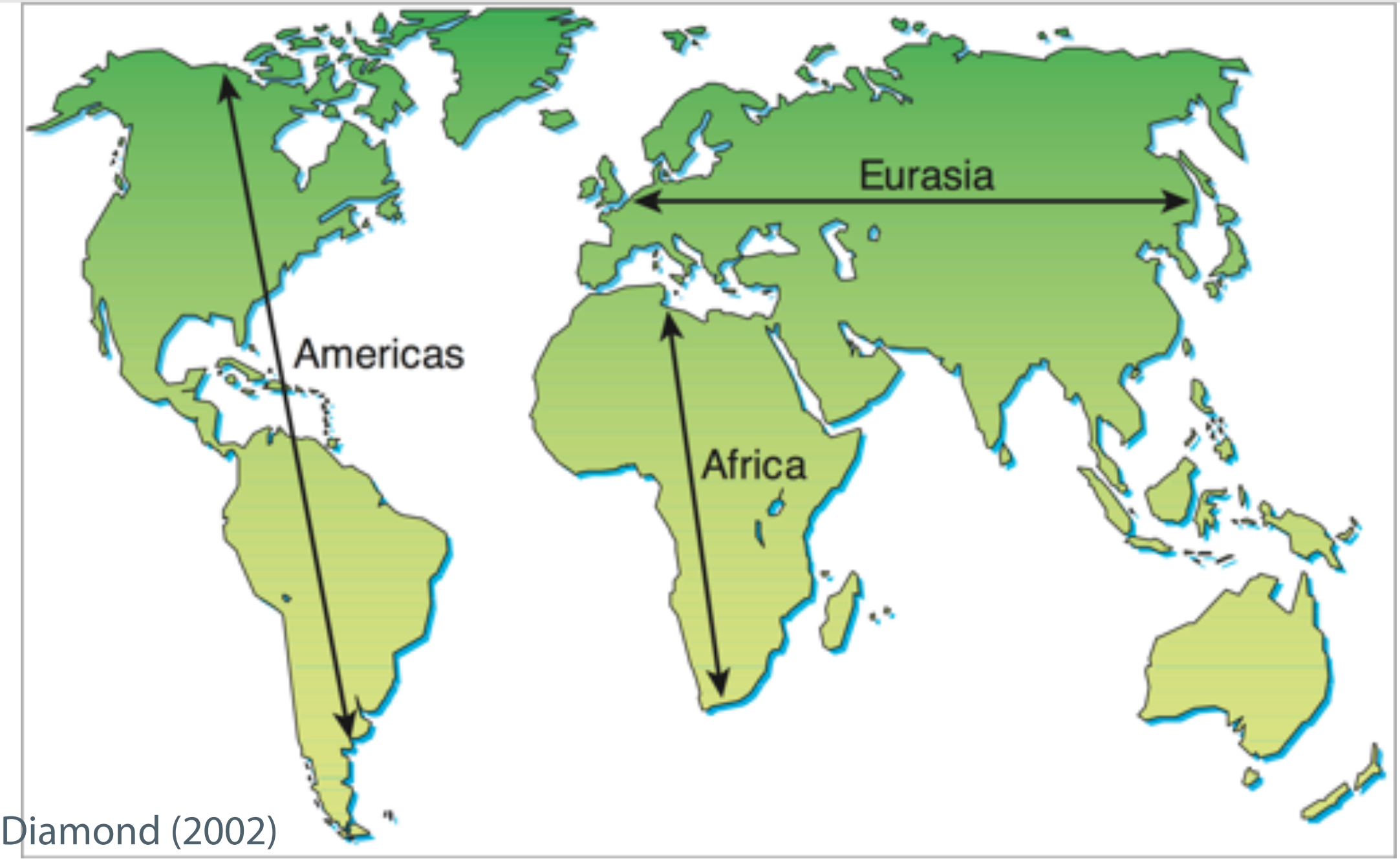
Distribution of plants and animals

Common food systems

Food production

- Increased crop yields
  - Larger population density
  - More frequent child-bearing
  - Storage of food surpluses $\rightsquigarrow$ can sustain specialists
  - Animals for warmth, transport and *germs (immunity of Eurasian population)*

GEOGRAPHIC ORIENTATION



Jared Diamond (2002)

CONTEMPORARY DEVELOPMENTS

Green revolution

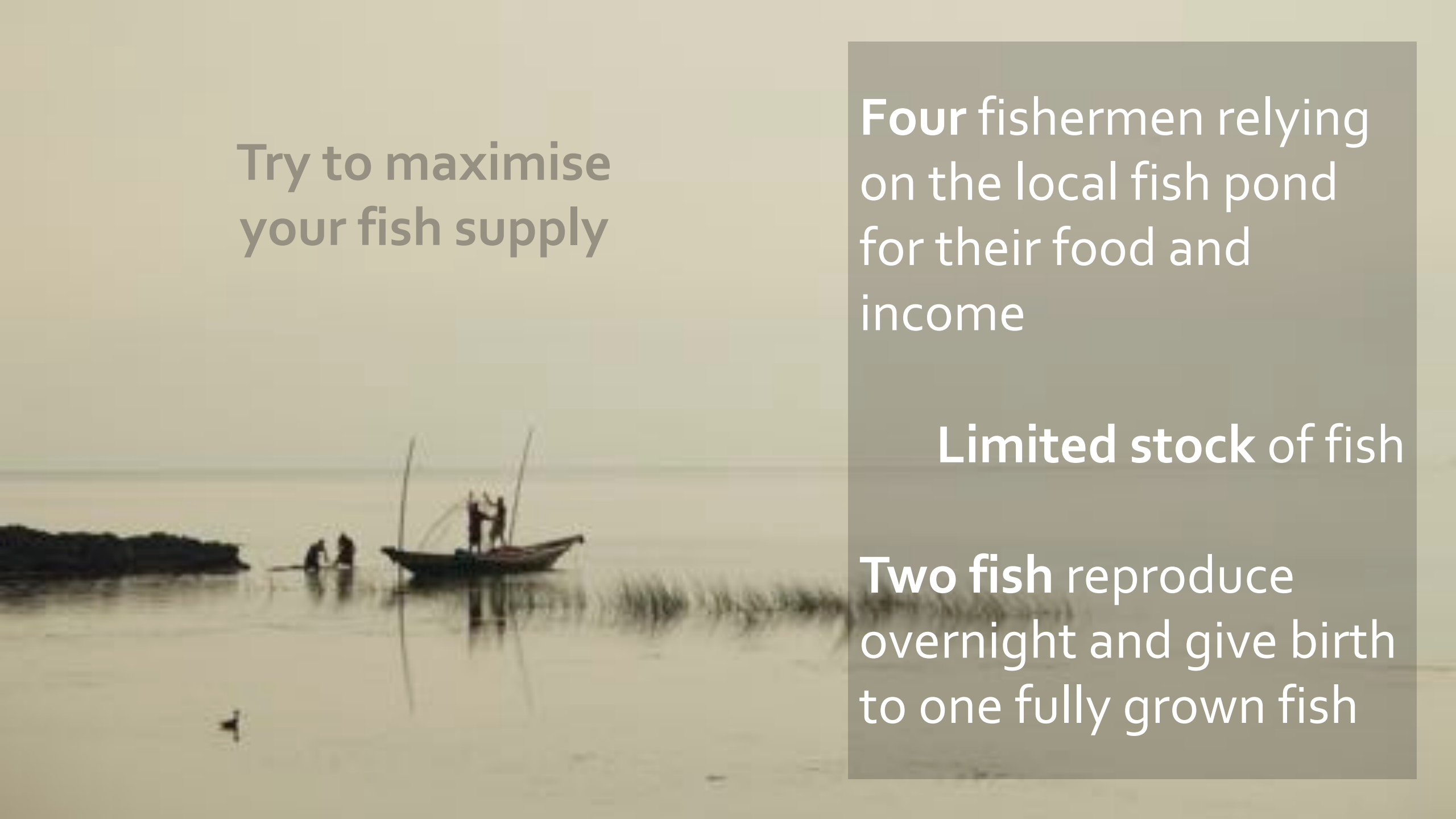
- Industrialisation
- Mechanisation
- Fertilisers

Paradigms for rural development

- A world view underlying the theories and methodology of a particular scientific subject
- Perception of the world
- Socially built and historical
- Guide development trajectories

Rural policies

- **Before 1980:** Interventionist paradigm
  - North: agricultural modernisation
  - South: State policies (green revolution, export)
  - Price control, public investments, State control
- **1980 - 2000:** Free market
  - North: Reforms
  - South: Structural Adjustment
  - Macro-economy, market regulation, privatisation
- **2000 - now:** Institutional economics
  - North: International Trade policies
  - South: Policies against poverty, agricultural policies
  - Imperfect markets, sustainable development



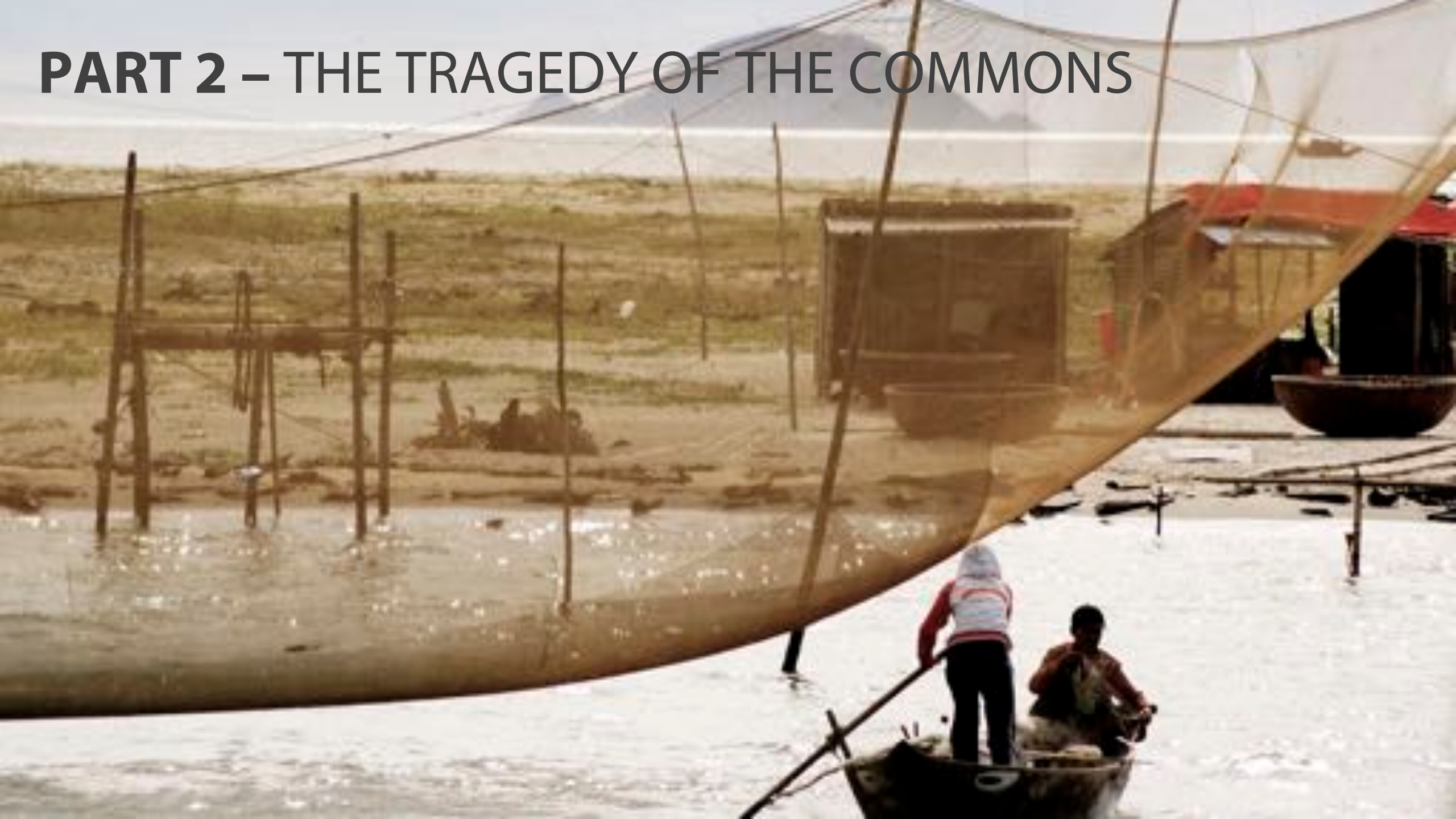
Try to maximise your fish supply

Four fishermen relying on the local fish pond for their food and income

Limited stock of fish

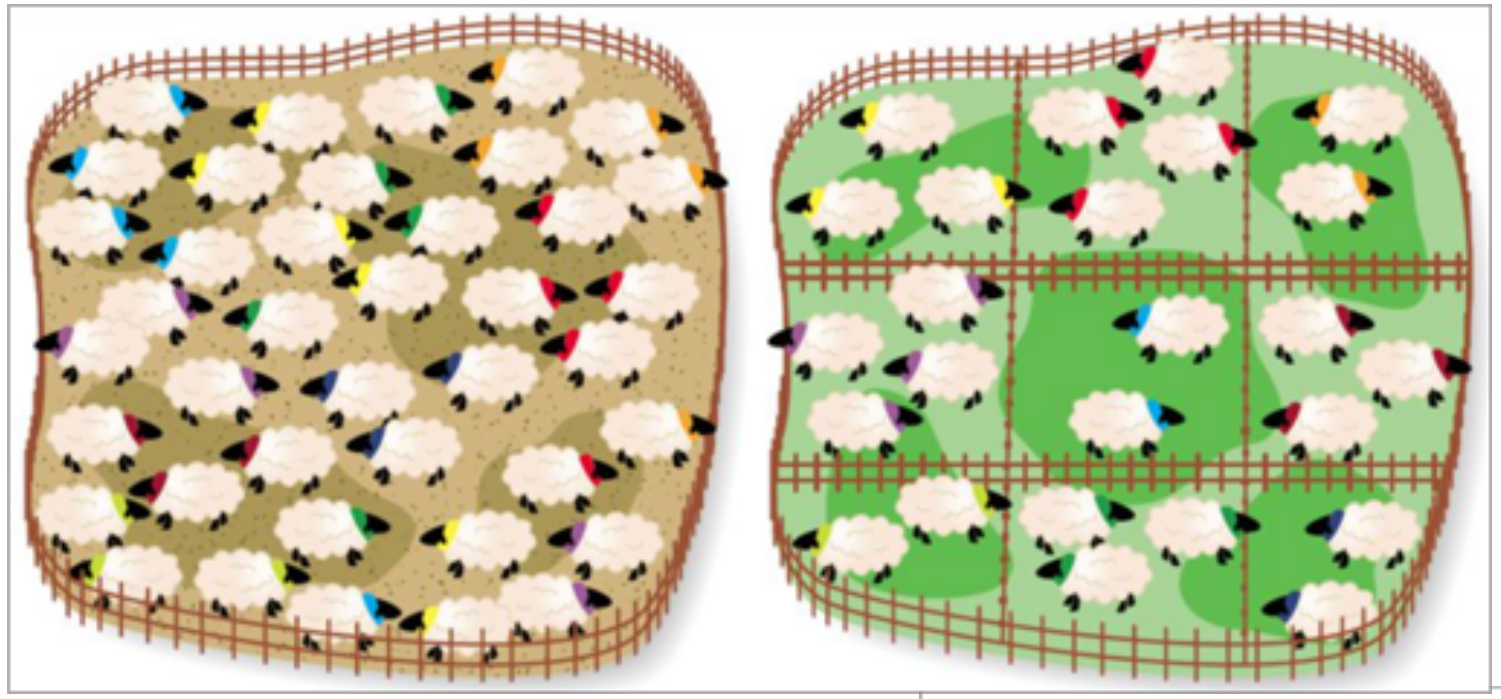
Two fish reproduce overnight and give birth to one fully grown fish

PART 2 – THE TRAGEDY OF THE COMMONS



Other examples

COMMON-POOL RESOURCES

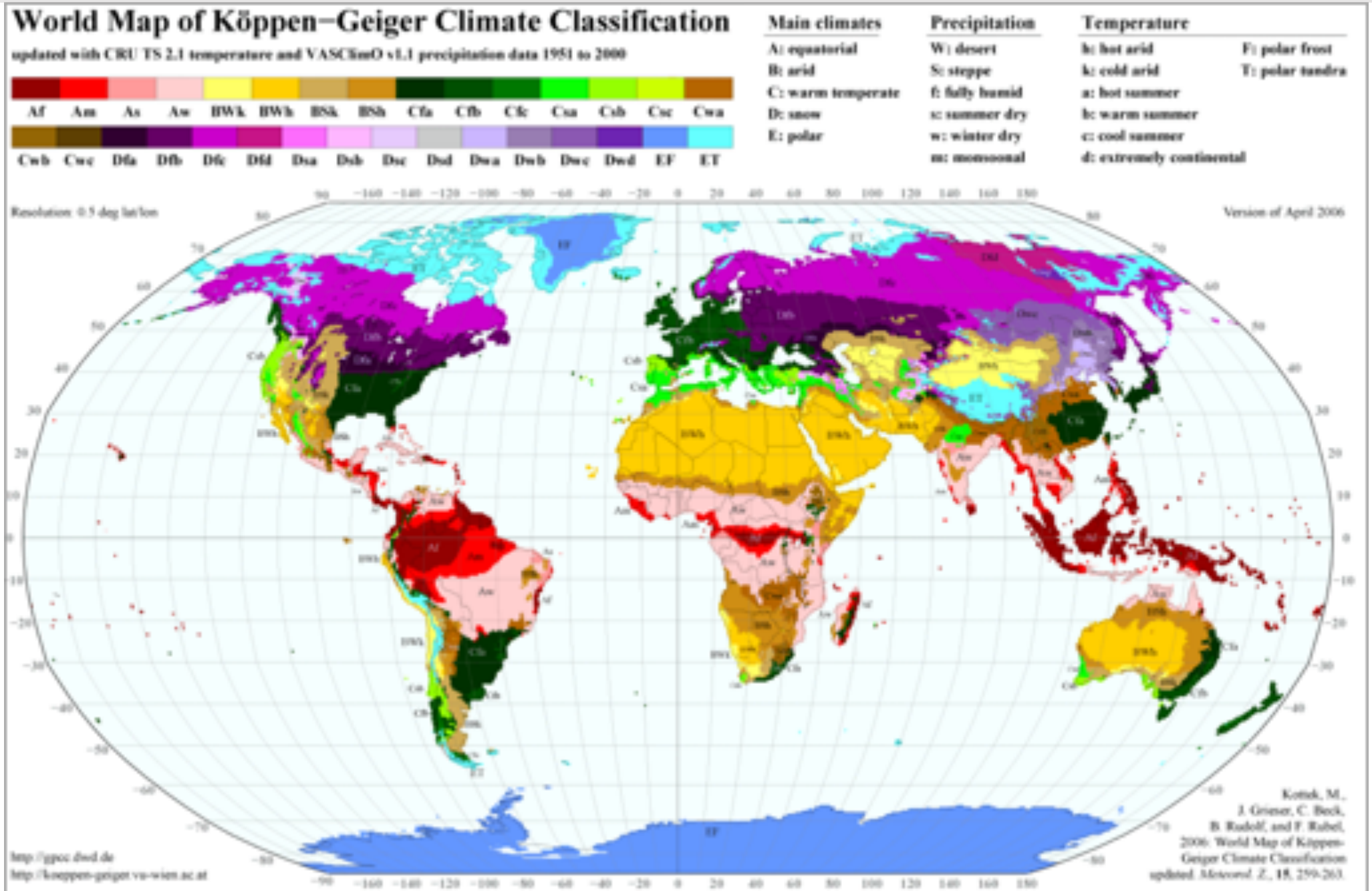


Garrett Hardin (1968)

	Excludable	Non-Excludable
Rivalrous	**Private Goods** food, clothing, cars, personal electronics	**Common Goods** fish stocks, timber, coal
Non-Rivalrous	**Club Goods** cinemas, private parks, satellite tv	**Public Goods** air, national defense

PART 3 – ECOSYSTEM SERVICES

CLIMATE AND ECO-REGIONS

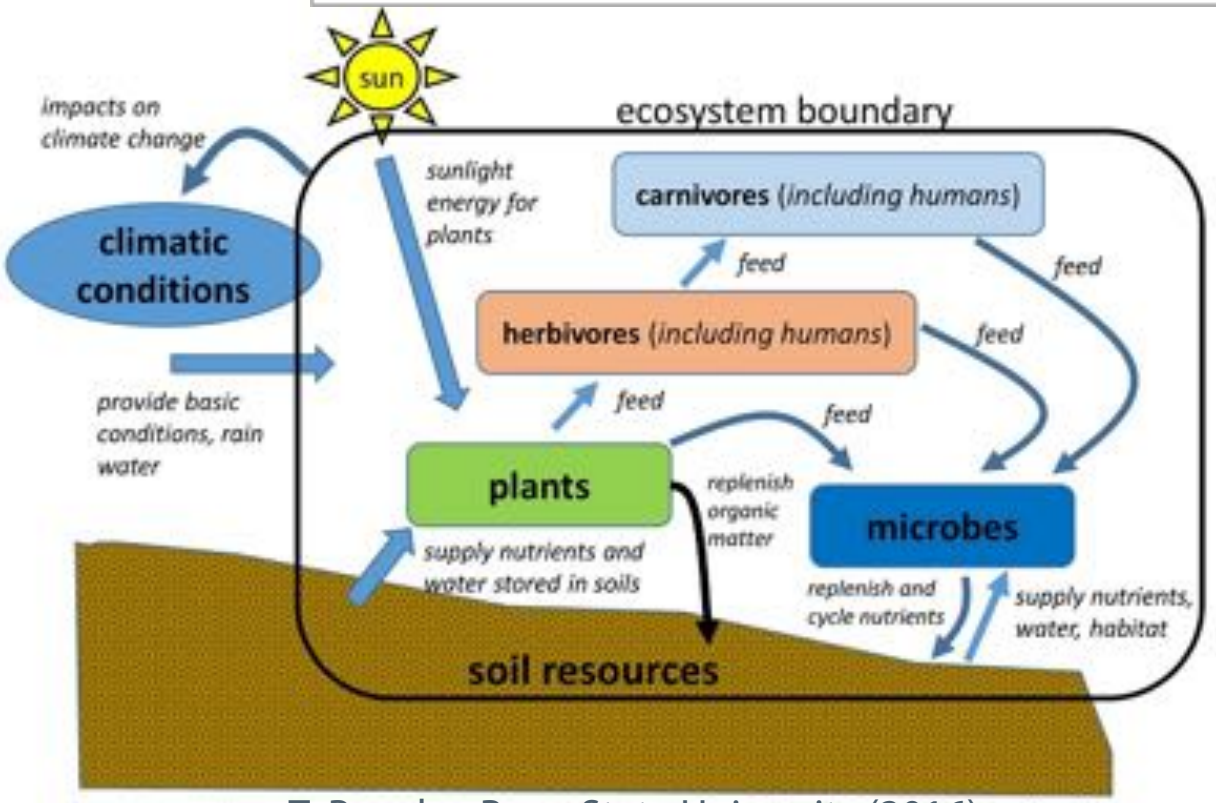


ECOSYSTEMS

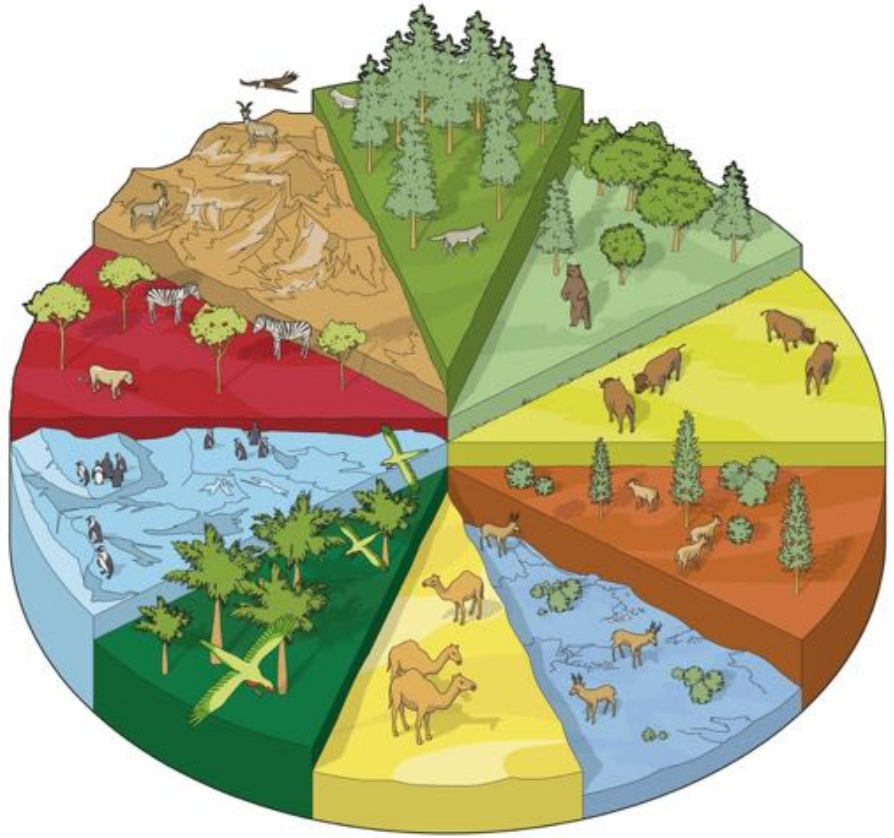
Definition

"ES are the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life"

Gretchen Daily (1997)



T. Brawler, Penn State University (2016)



ECOSYSTEM SERVICES

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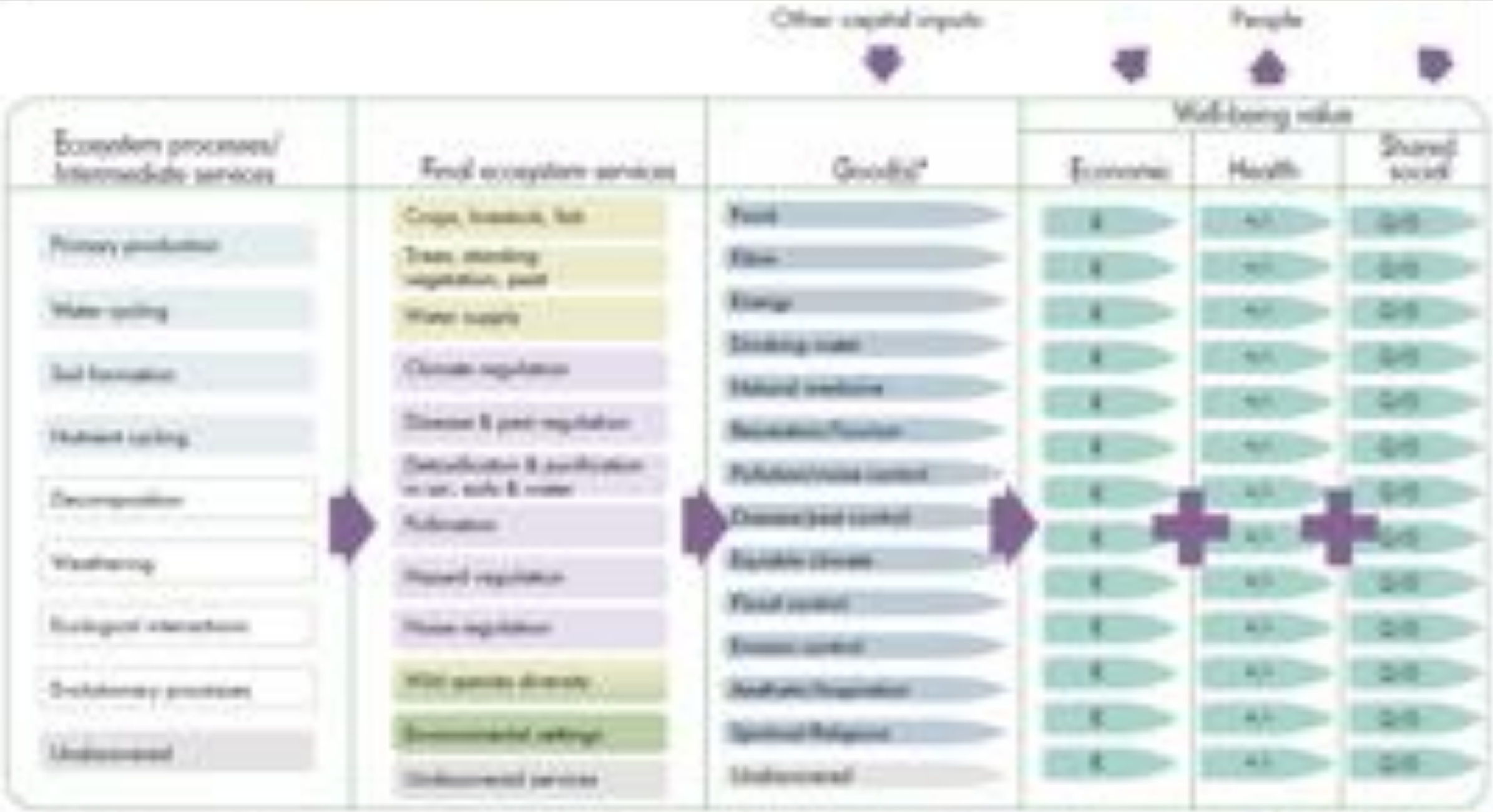


ECOSYSTEM SERVICES

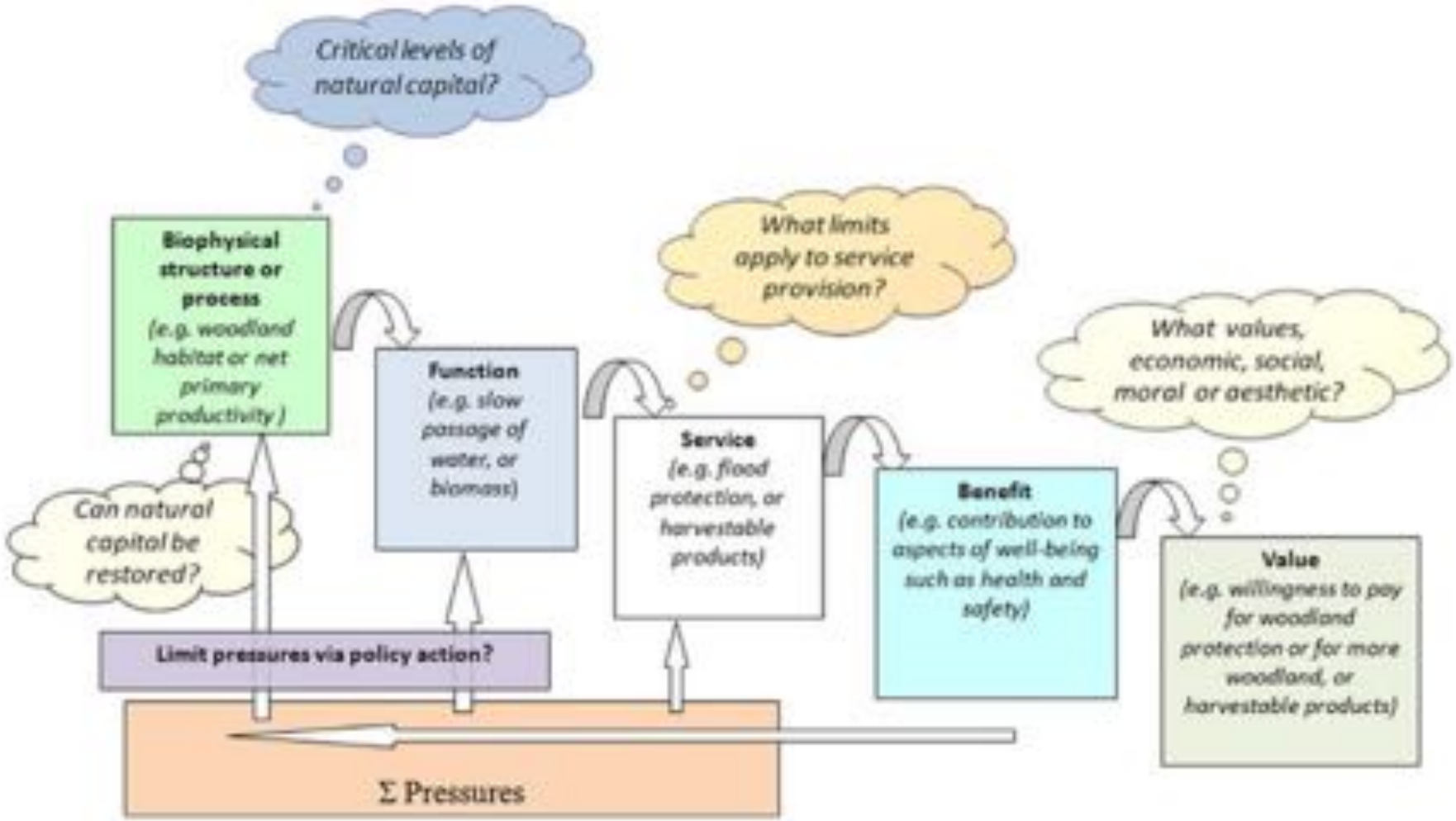


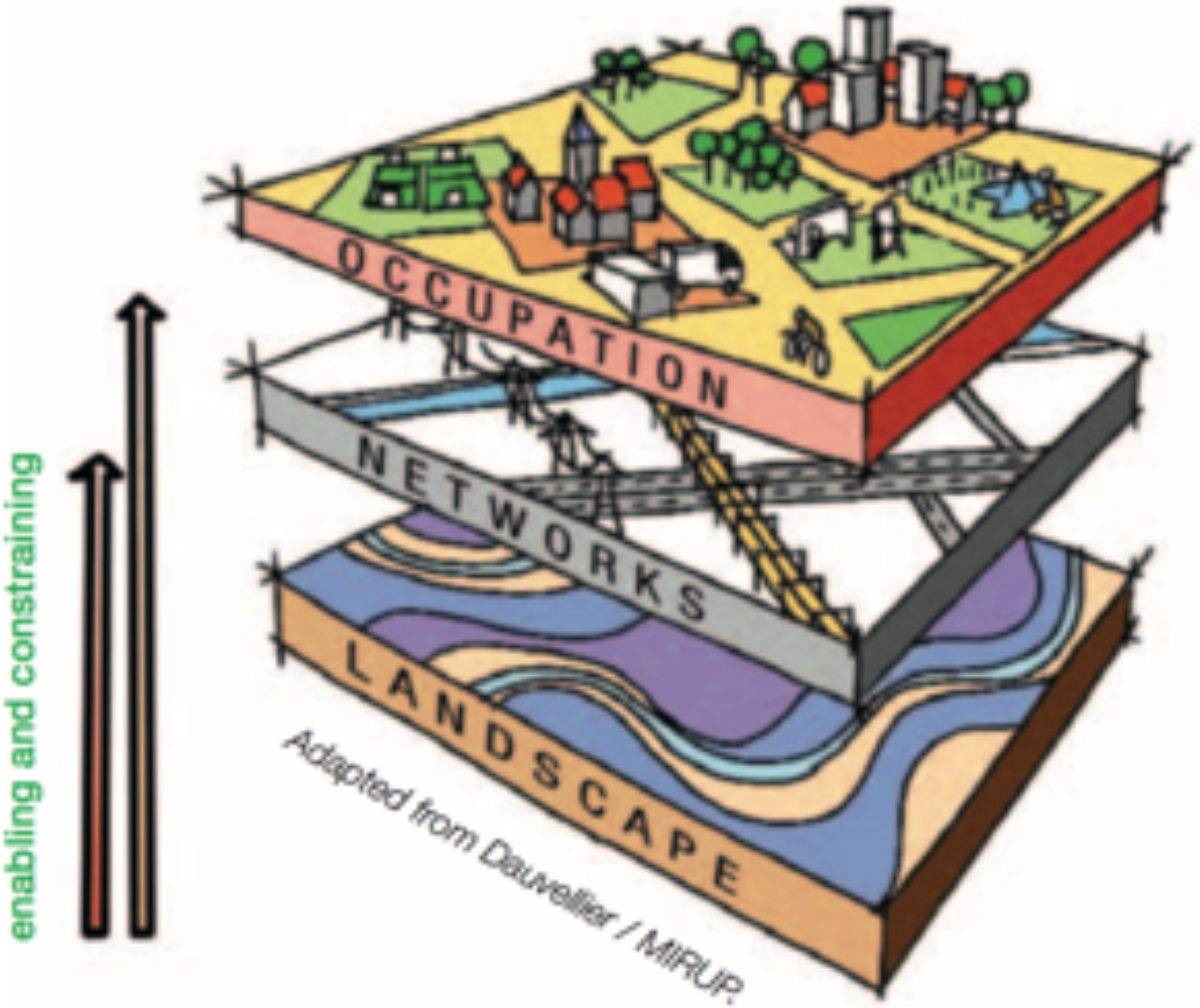
Figure 2. The ecosystem service cascade model initially proposed in Haines-Young and Potschin (2010a) modified to separate benefits and values in De Groot et al. (2010)

SCALES: LOCAL TO GLOBAL

occupation
speed of change
10 - 25 years

networks
speed of change
25 - 100 years

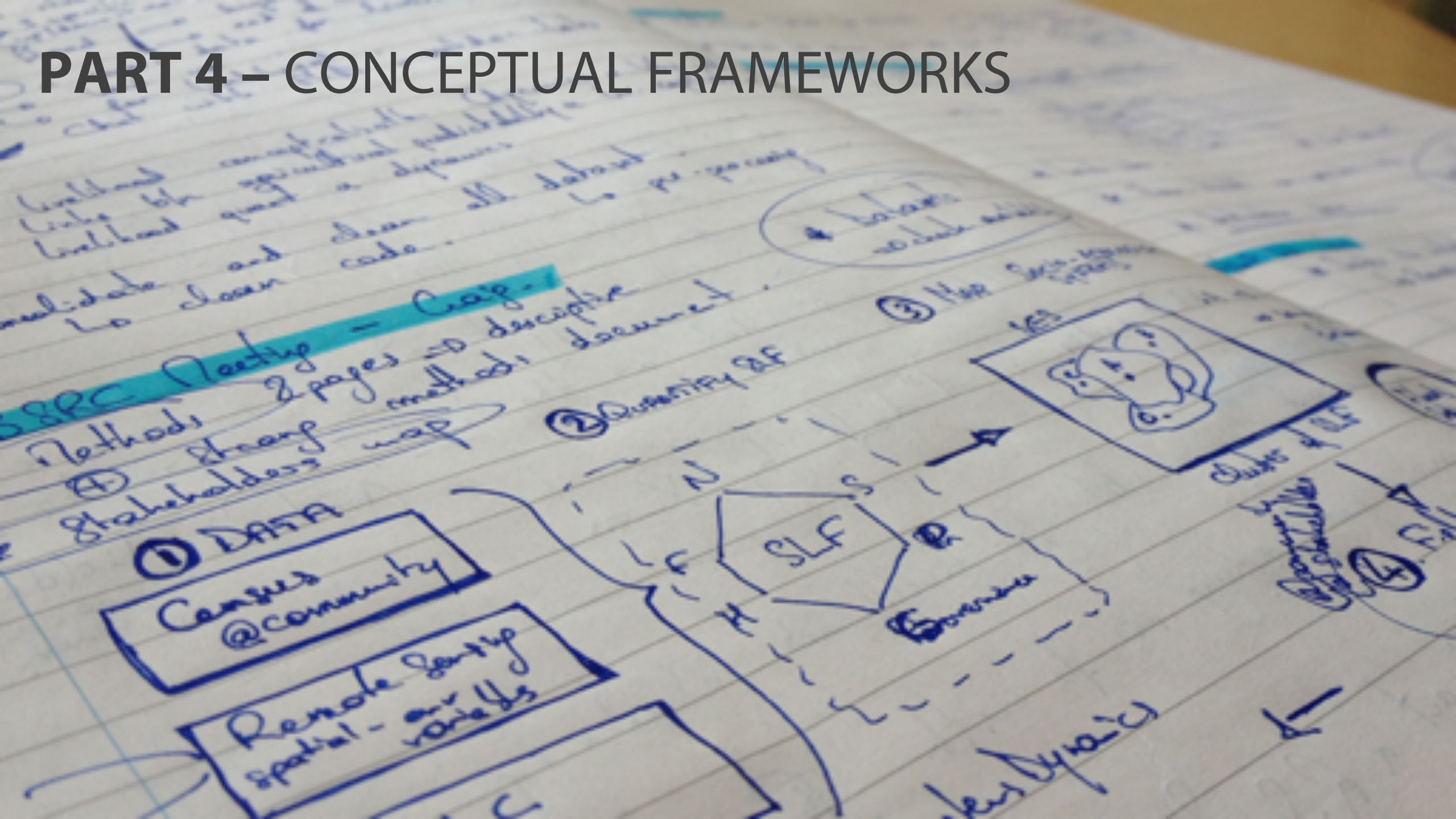
landscape
speed of change
50 - 500 years



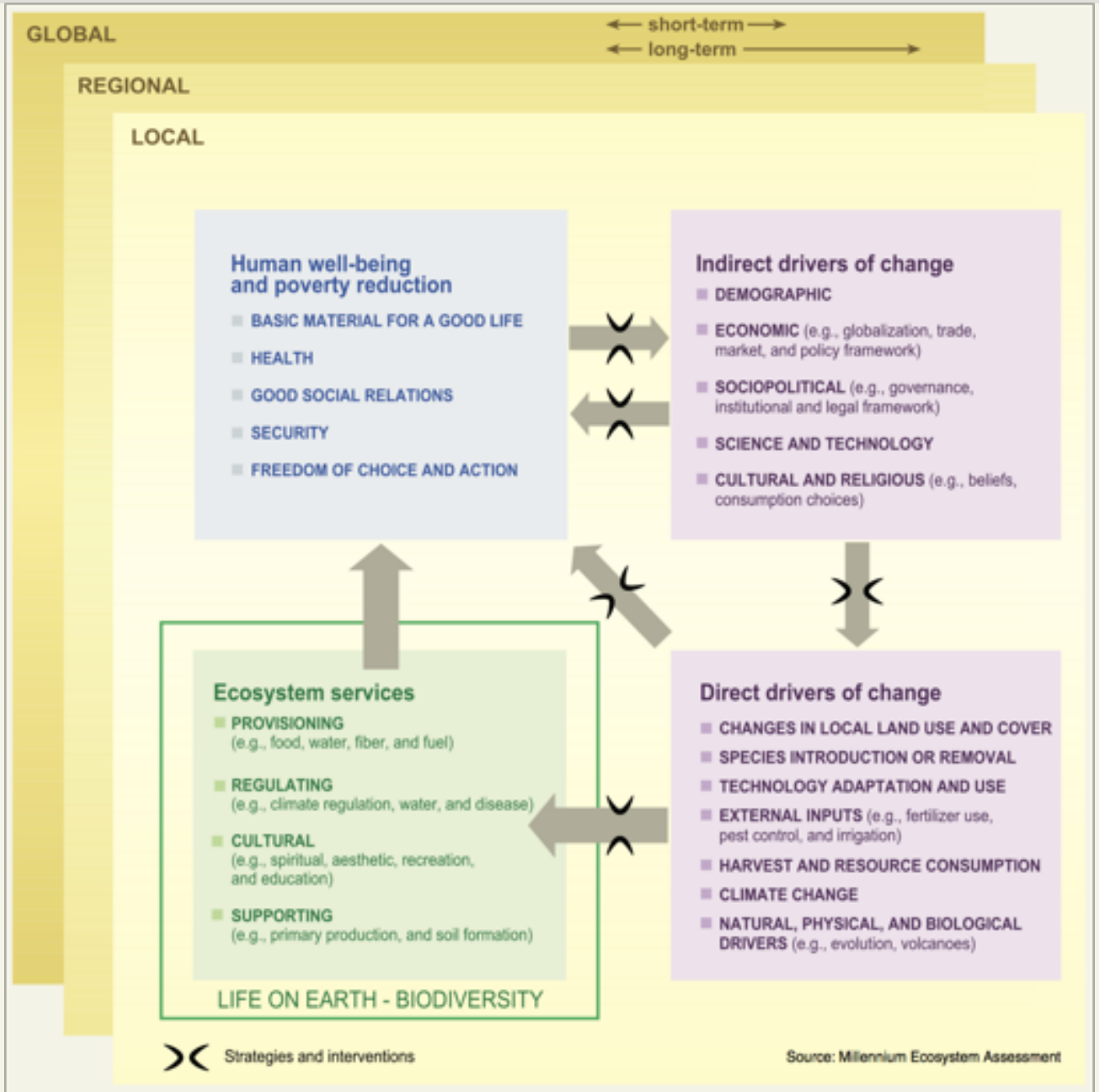
private

public

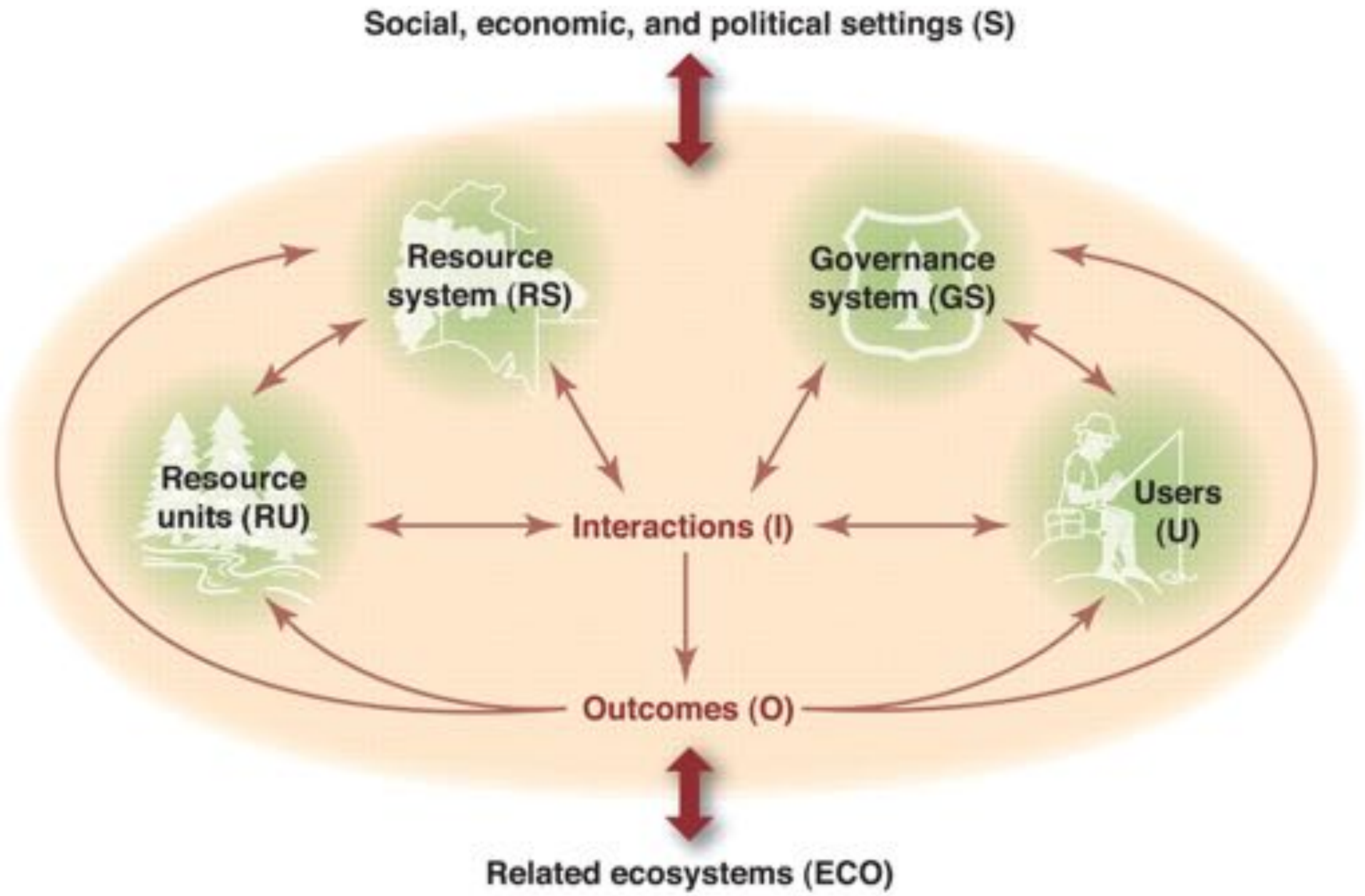
PART 4 – CONCEPTUAL FRAMEWORKS



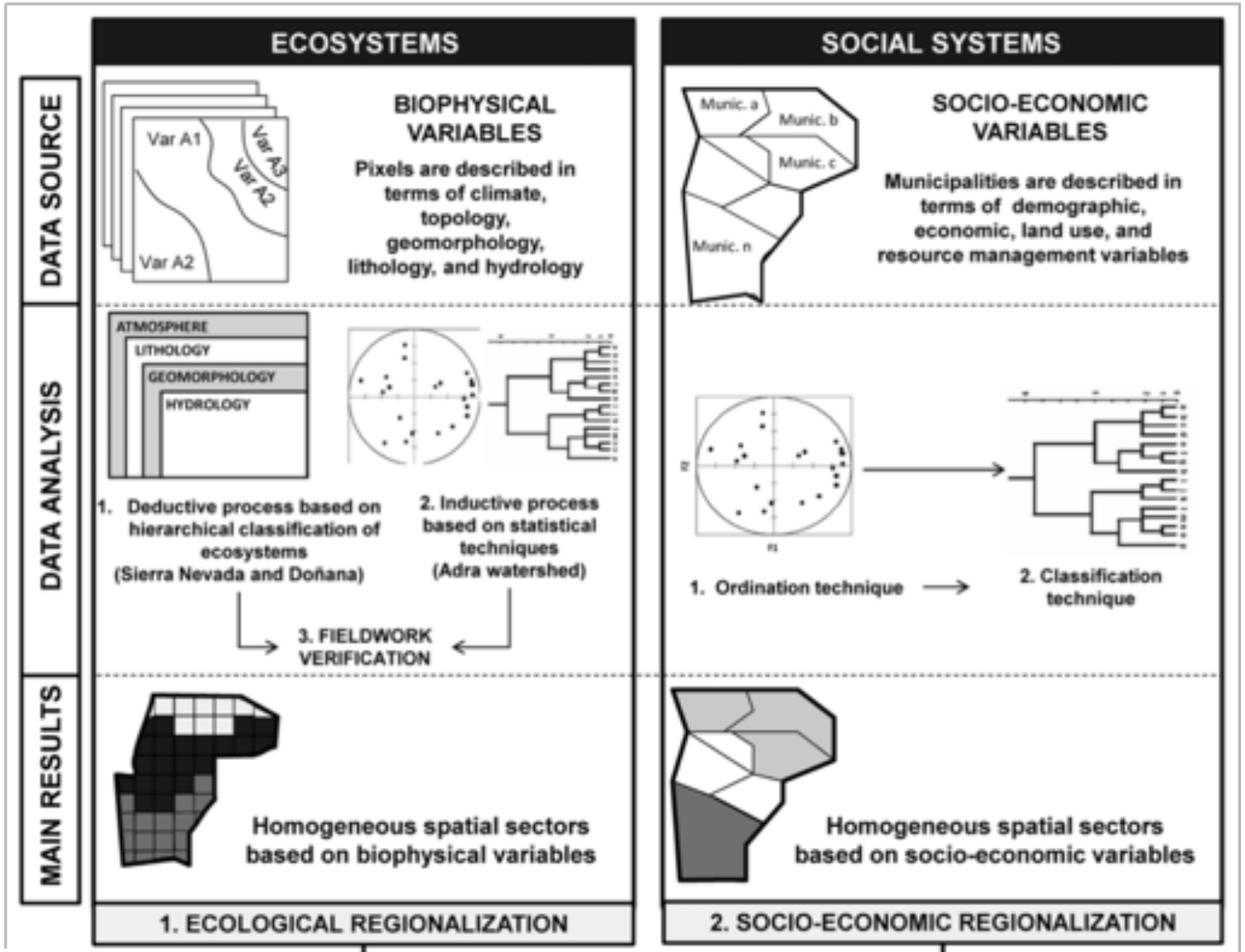
MILLENIUM ECOSYSTEM ASSESSMENT



SOCIO-ECOLOGICAL SYSTEMS



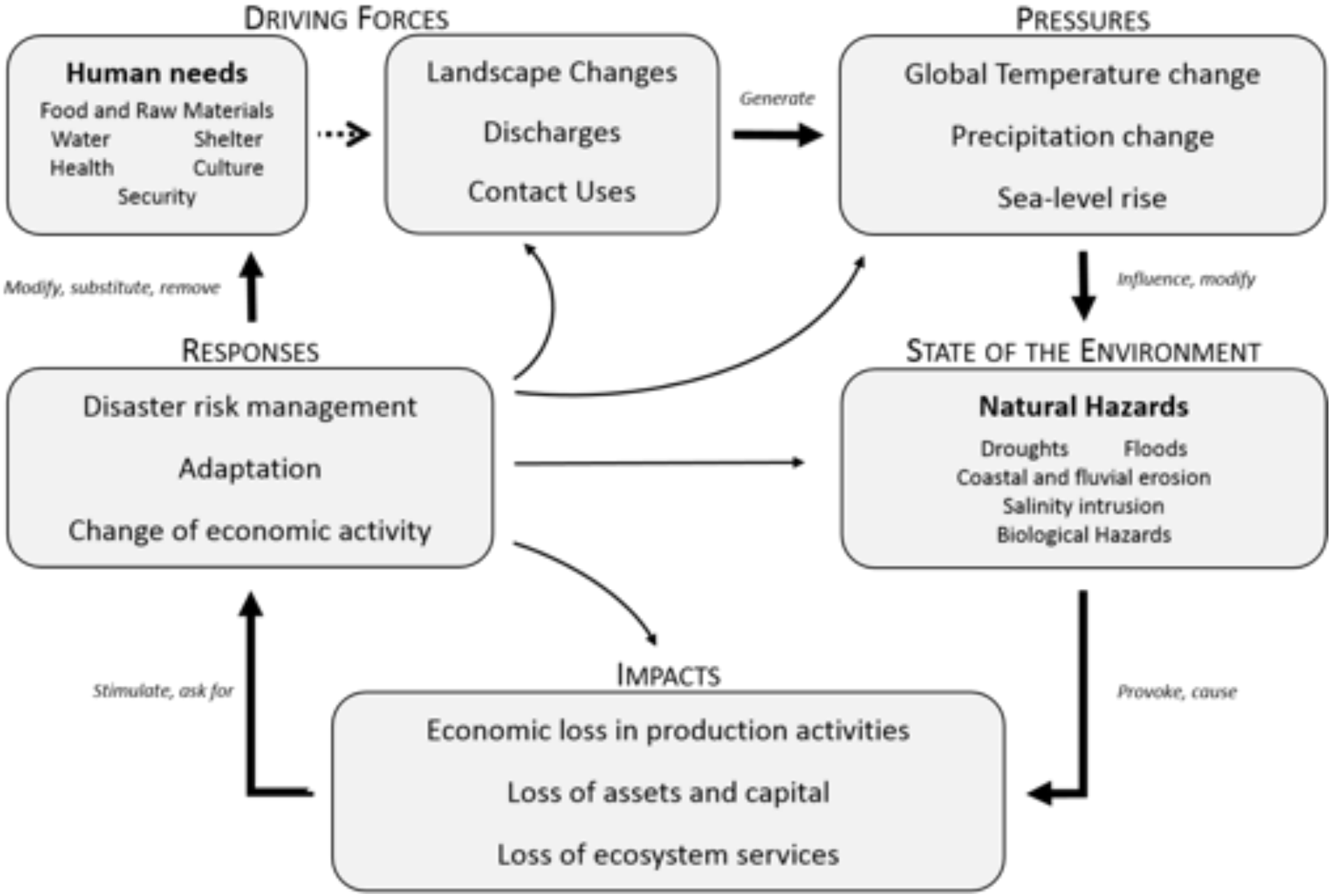
SOCIO-ECOLOGICAL SYSTEMS



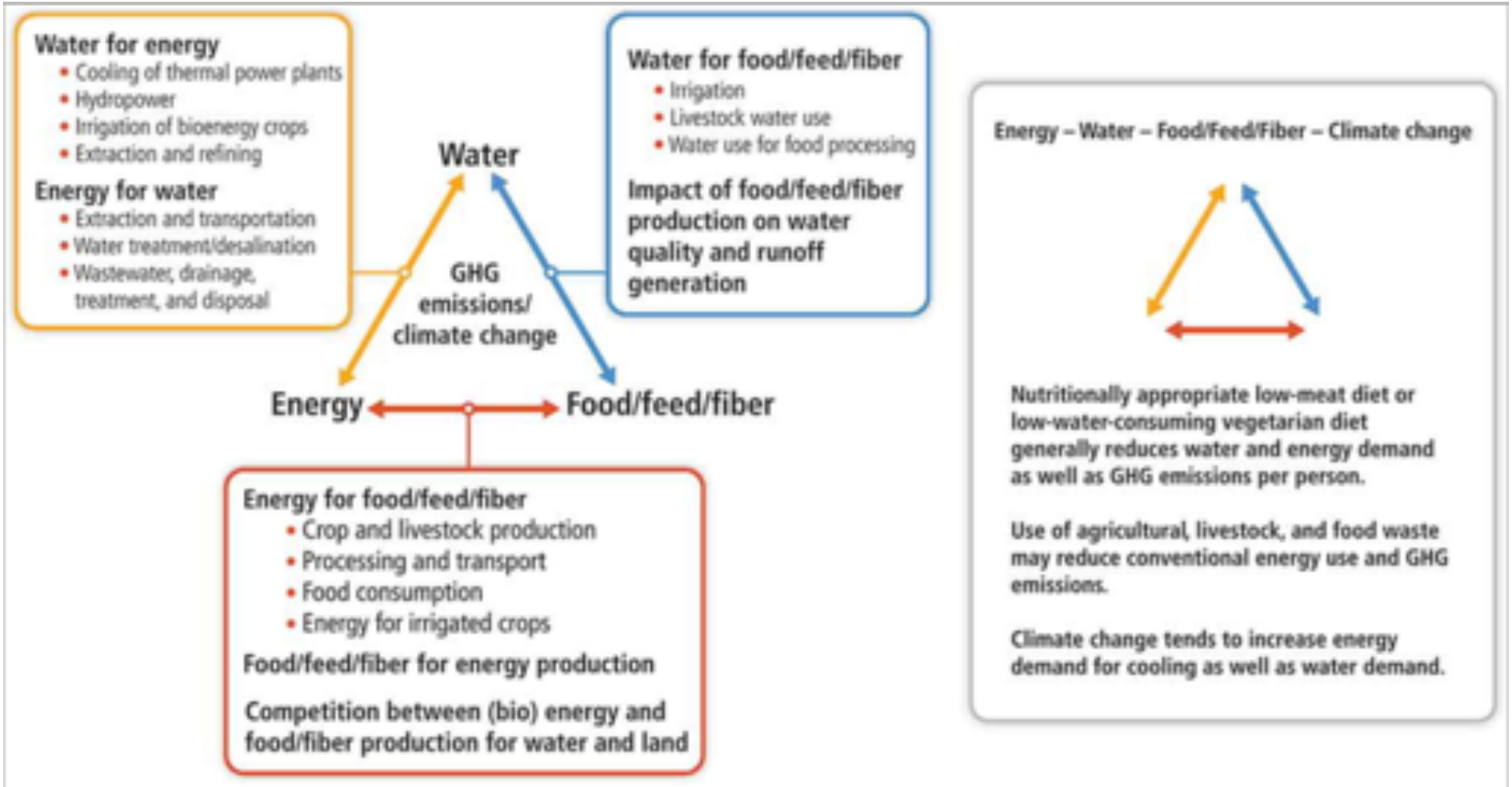
Delineating boundaries of social-ecological systems for landscape planning: A comprehensive spatial approach

Berta Martín-López[a,*], Ignacio Palomo[b,c], Marina García-Llorente[c,d], Irene Iniesta-Arandia[c], Antonio J. Castro[e,f], David García Del Amo[c], Erik Gómez-Baggethun[g,h], Carlos Montes[c]

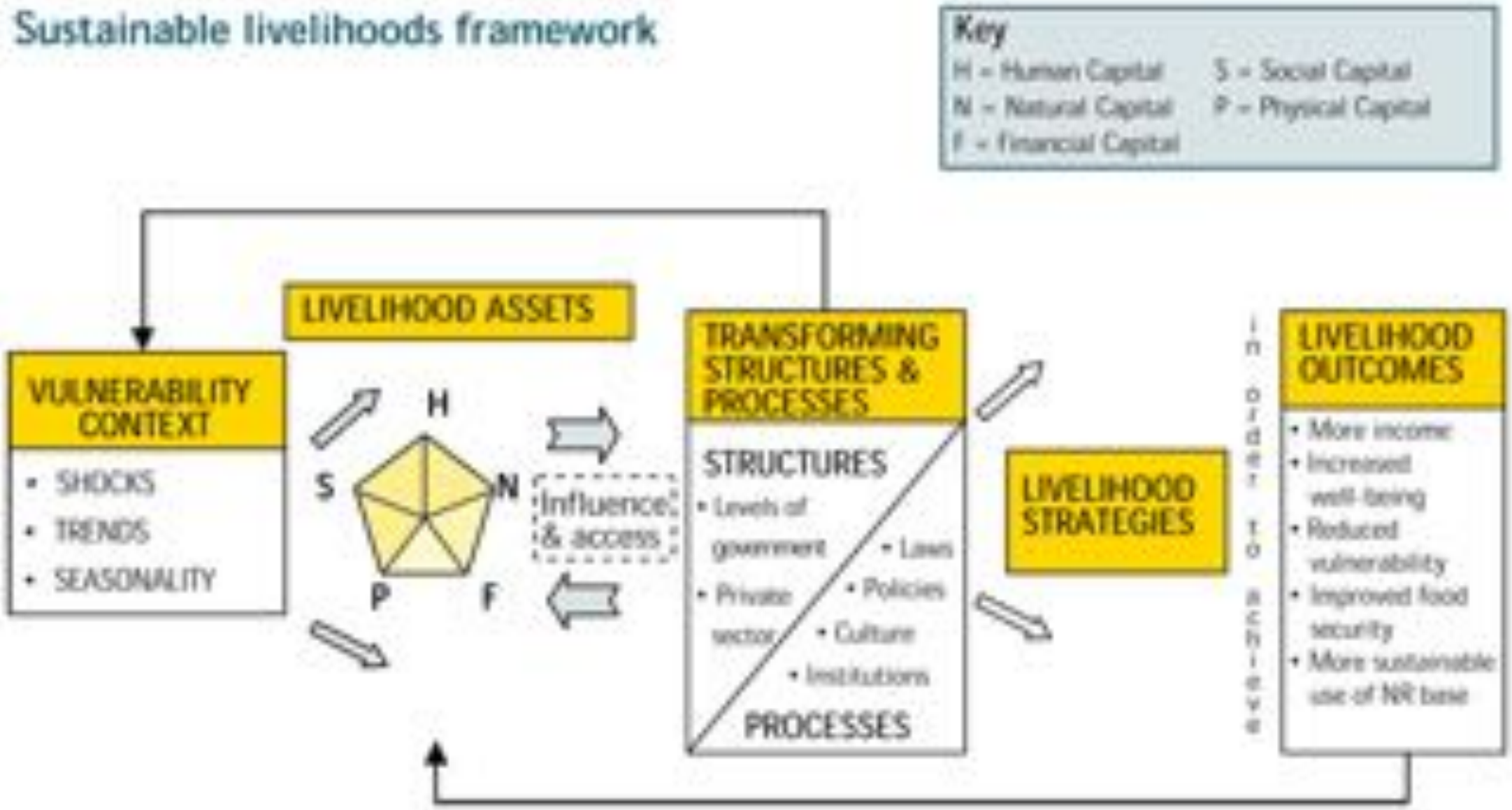
DPSIR


DRIVING FORCES
Human needs
Food and Raw Materials
Water
Shelter
Health
Culture
Security
Landscape Changes
Discharges
Contact Uses
Generate
PRESSURES
Global Temperature change
Precipitation change
Sea-level rise
Modify, substitute, remove
Influence, modify
RESPONSES
Disaster risk management
Adaptation
Change of economic activity
STATE OF THE ENVIRONMENT
Natural Hazards
Droughts
Floods
Coastal and fluvial erosion
Salinity intrusion
Biological Hazards
Stimulate, ask for
Provoke, cause
IMPACTS
Economic loss in production activities
Loss of assets and capital
Loss of ecosystem services

FOOD-WATER-ENERGY NEXUS

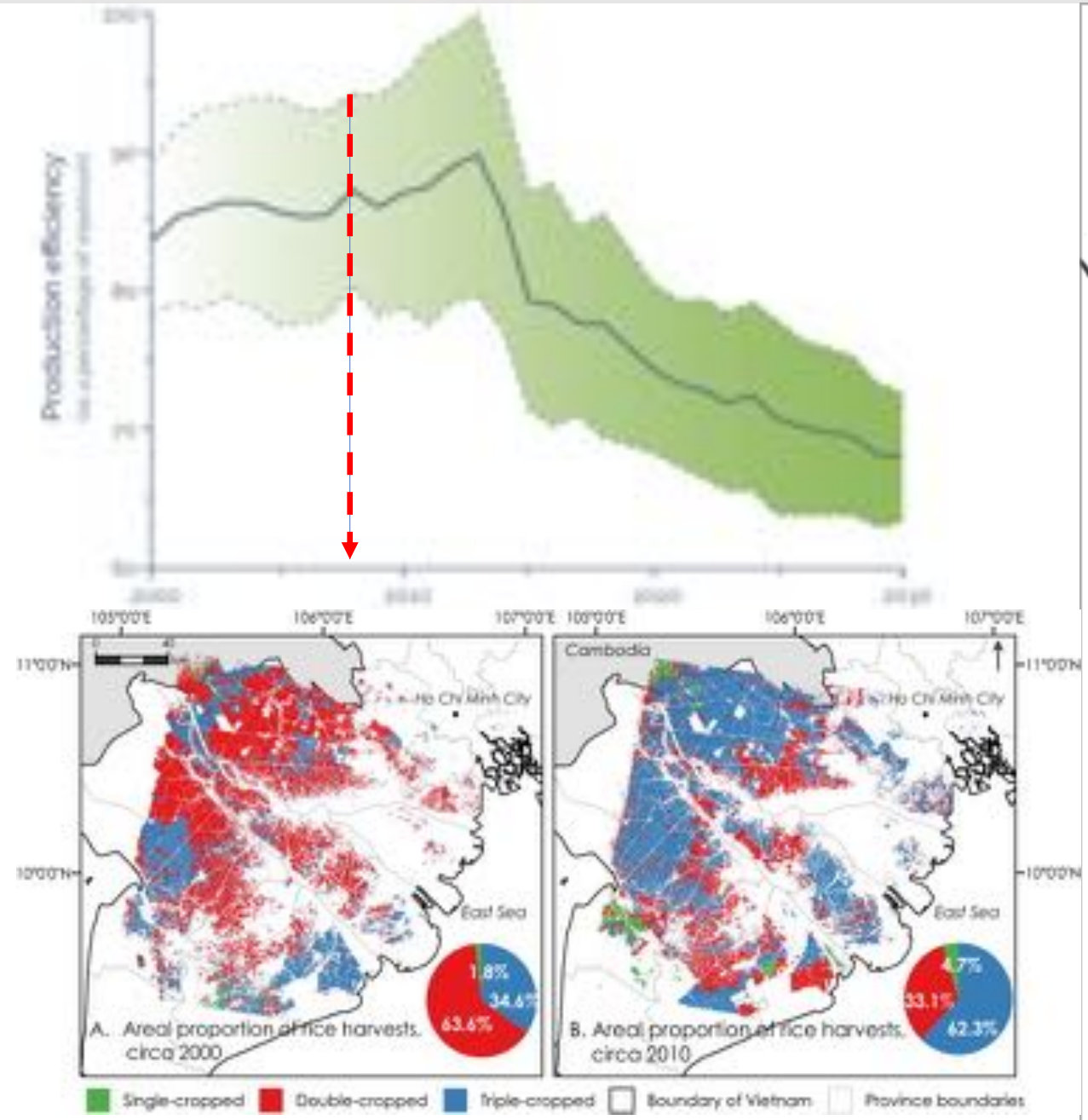


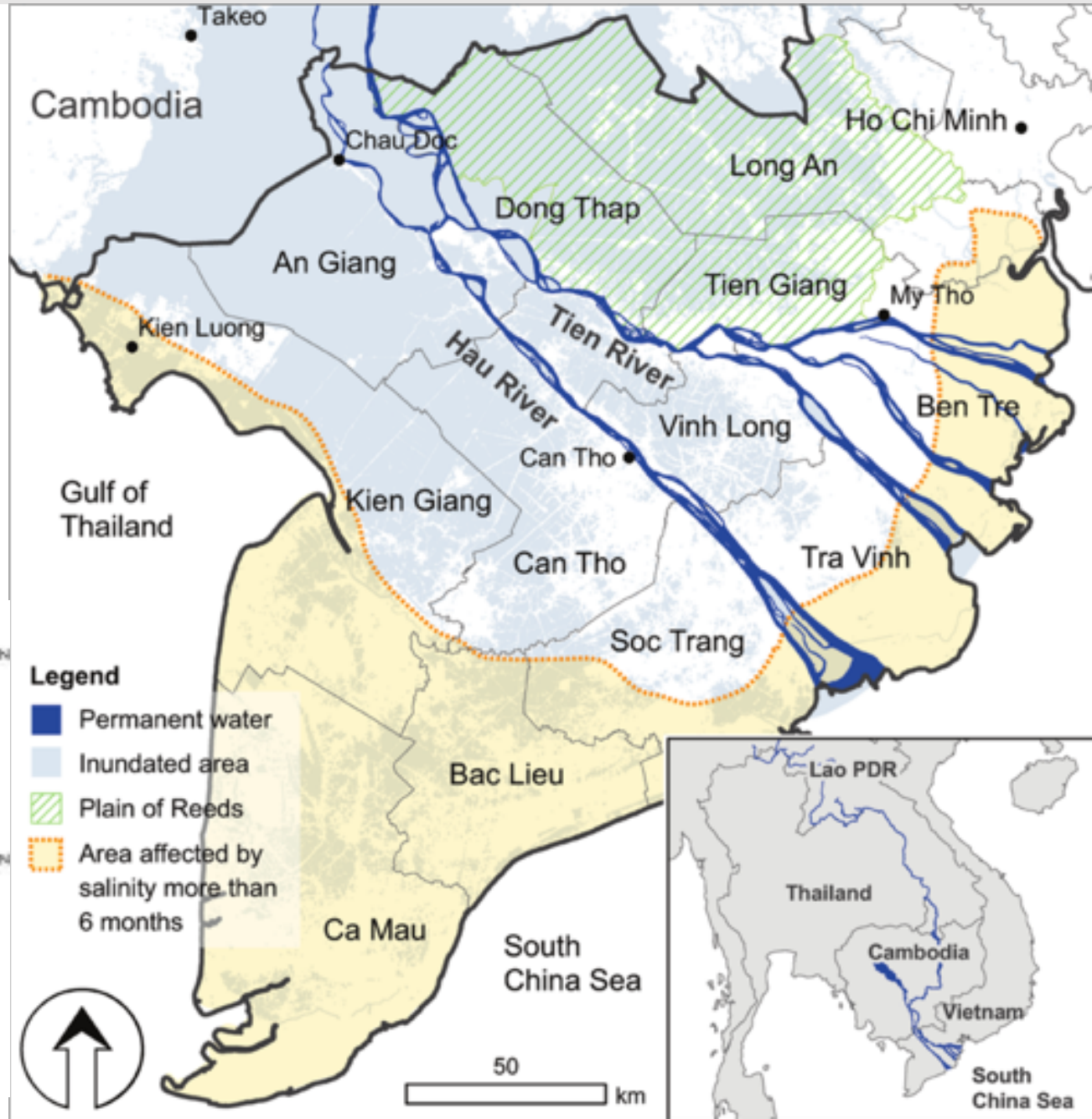
SUSTAINABLE LIVELIHOOD FRAMEWORK



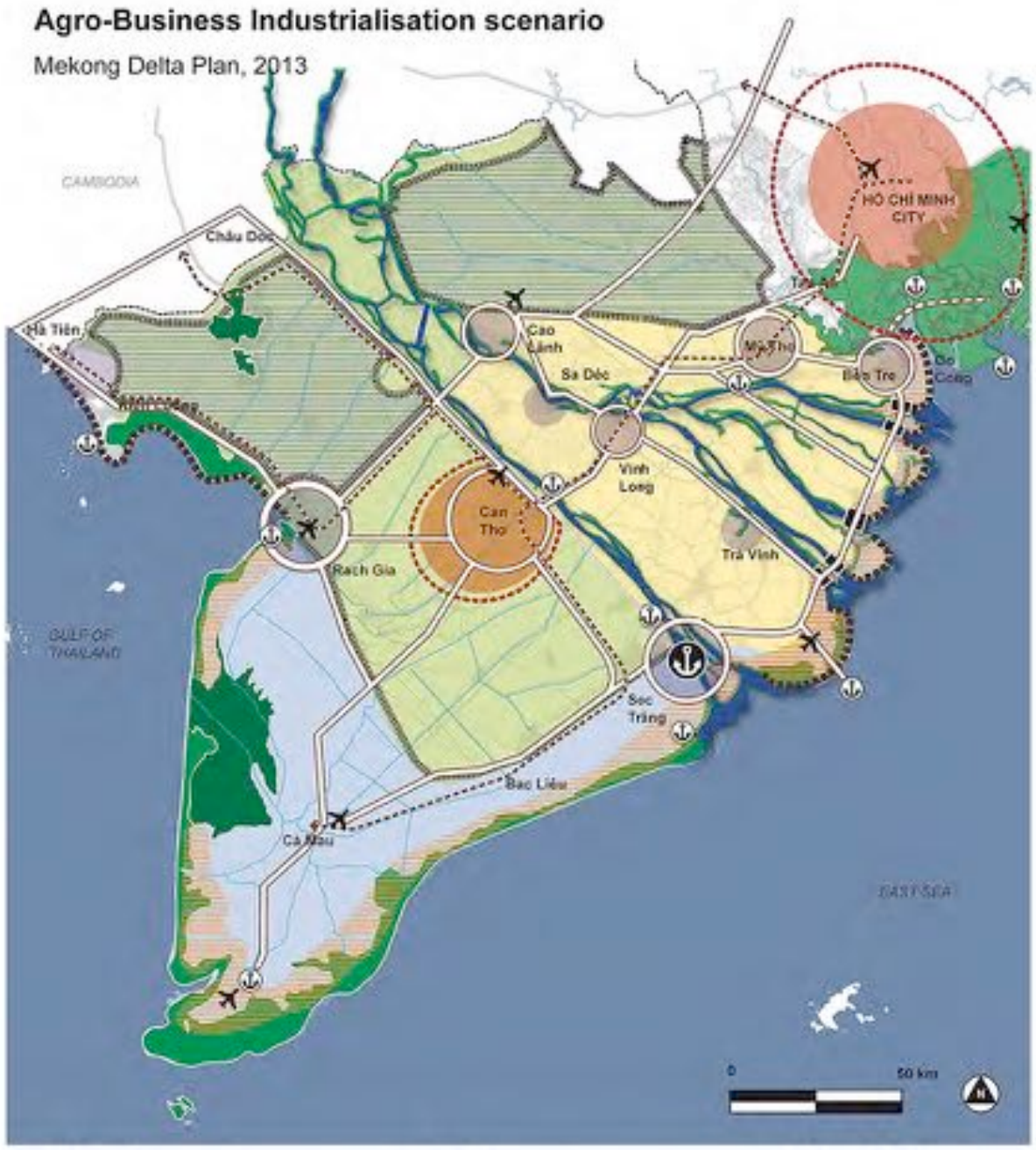
PART 5 – CASE STUDY

RICE PRODUCTION





DELTA PLAN



Population growth - The premise for this scenario is a decline of the rural population that migrates towards economic centres outside the delta. The expected population by 2050 is around 15 million.

Economic growth – Low to moderate global economic growth. Nevertheless, a stable GDP growth is achieved in the Delta through efficient high-value agriculture production.

Figure 4-6 Development pathways of the socio-economic drivers for the Agro-Business Industrialisation scenario

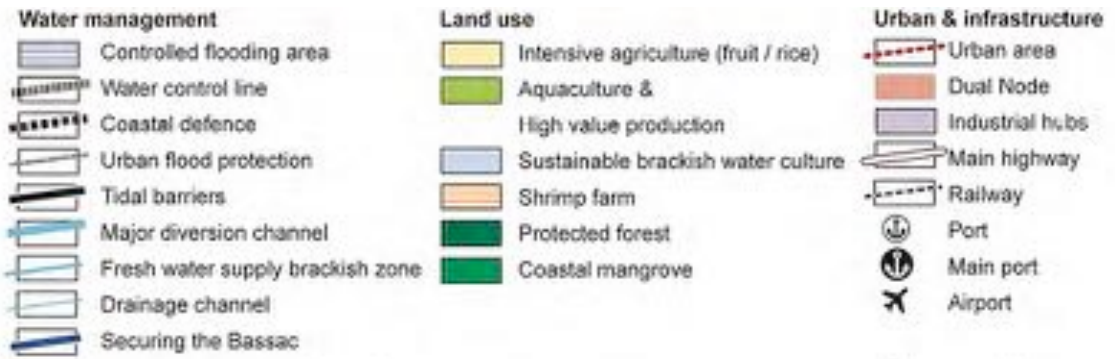
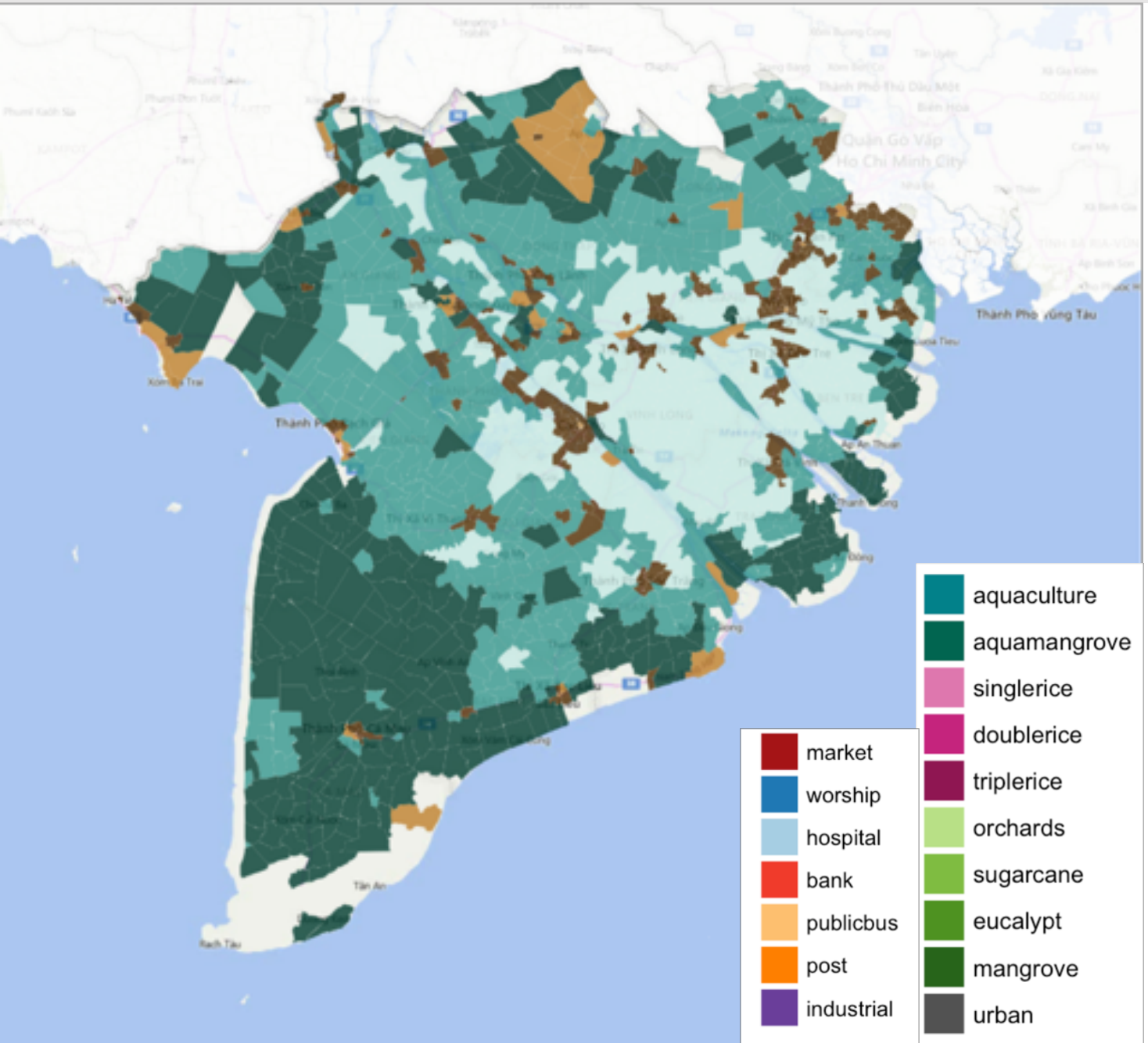


Figure 4-7 Agro-Business Industrialisation, economy scenario, assuming successful spatial planning and water resources management

PROFILING SOCIO-ECOLOGICAL SYSTEMS



PART 6 – PRACTICAL

NATIONAL PARKS

National Parks in the UK

- Natural landscapes (including coasts, mountains and forests)
- **1949:** National Parks and Access to the Countryside Act
  - to protect UK's areas of natural beauty
  - to ensure that everyone could enjoy them today and in the future
- 12 national parks across England and Wales

Lake District

- Created in 1951
- UK's largest National Park - 12 million visitors a year
- Reasons to visit
  - Hill walking
  - Rock climbing
  - Mountain biking
  - Fishing
  - Boating
  - Historical buildings, lakes, mountains
- Managed by the National Parks Authority (NPA)
  - Tries to balance the conflicting priorities of different park users

NATIONAL PARKS

Student Activity

- Identify the different park users
- Identify their priorities

Users and priorities

1. Conservation and wildlife groups
   - Protection of park's environment and wildlife, at risk from excessive tourism
2. Tourists
   - Want infrastructures (roads, parking, accommodation, shops, restaurants)
3. Local businesses
   - Want more and more visitors
4. Farmers
   - Concerned about damages to fences and livestock by walkers and dogs
5. Local residents
   - Worried about congestion, littering, noise pollution and footpath erosion

Users and priorities

If not balanced, these competing interests could lead to:

- Damage to the environment
- Local people becoming angry/hostile
- Tourists being deterred from visiting the park

Student Activity

- Think of measures to implement to maintain the Lake District for future generations

SUSTAINABLE MANAGEMENT

Measures adopted to maintain it for future generations

1. Footpath maintenance - *National Trust and conservation groups*
   - Paths rebuilt
   - Access restricted to reduce the effects on paths and vegetation
2. Public transport subsidied
   - Visitors encouraged to use the buses instead of bringing their cars into the national park
3. Restricted parking zones
   - Expansion of the car park on the edge of the village
   - Restriction of parking on grass verges and near houses
4. Raising awareness
   - Of conservation issues for visitors
   - Posters and leaflets at tourist information centres

Measures adopted to maintain it for future generations

- Controversial measure: 10mph speed limit for powerboats and water-skiers
  - Noise of the boats = spoiling the lake for other users (swimmers and canoeists)
  - Wakes from powerboats = shore erosion
  - Pollution and disappearance of reed beds in the lake
  - Businesses have been affected. Objection to the change.

CONCLUSION – SUSTAINABLE FUTURES

ECOLOGICAL COSTS

Ecological costs of specialised human activities

J. Pretty (1998)

- Contamination of natural resources (water, food, fodder, atmosphere) by pesticides, nitrates, livestock wastes
  - Causing harm to wildlife and disruptions of ecosystems
  - Causing harm to farmworkers and public
  - Ammonia, play a role in ozone depletion and global warming
- Overuse of natural resources
  - Depletion of groundwater, loss of wild foods and habitats
  - Reduction of their capacity to absorb wastes, causing water-logging and increased salinity
- Tendency (esp. in agriculture) to standardise and specialise
  - Focus on modern varieties
  - Displacement of traditional varieties and breeds
- New health hazards for workers
  - Agrochemical and food-processing industries

CLIMATE CHANGE