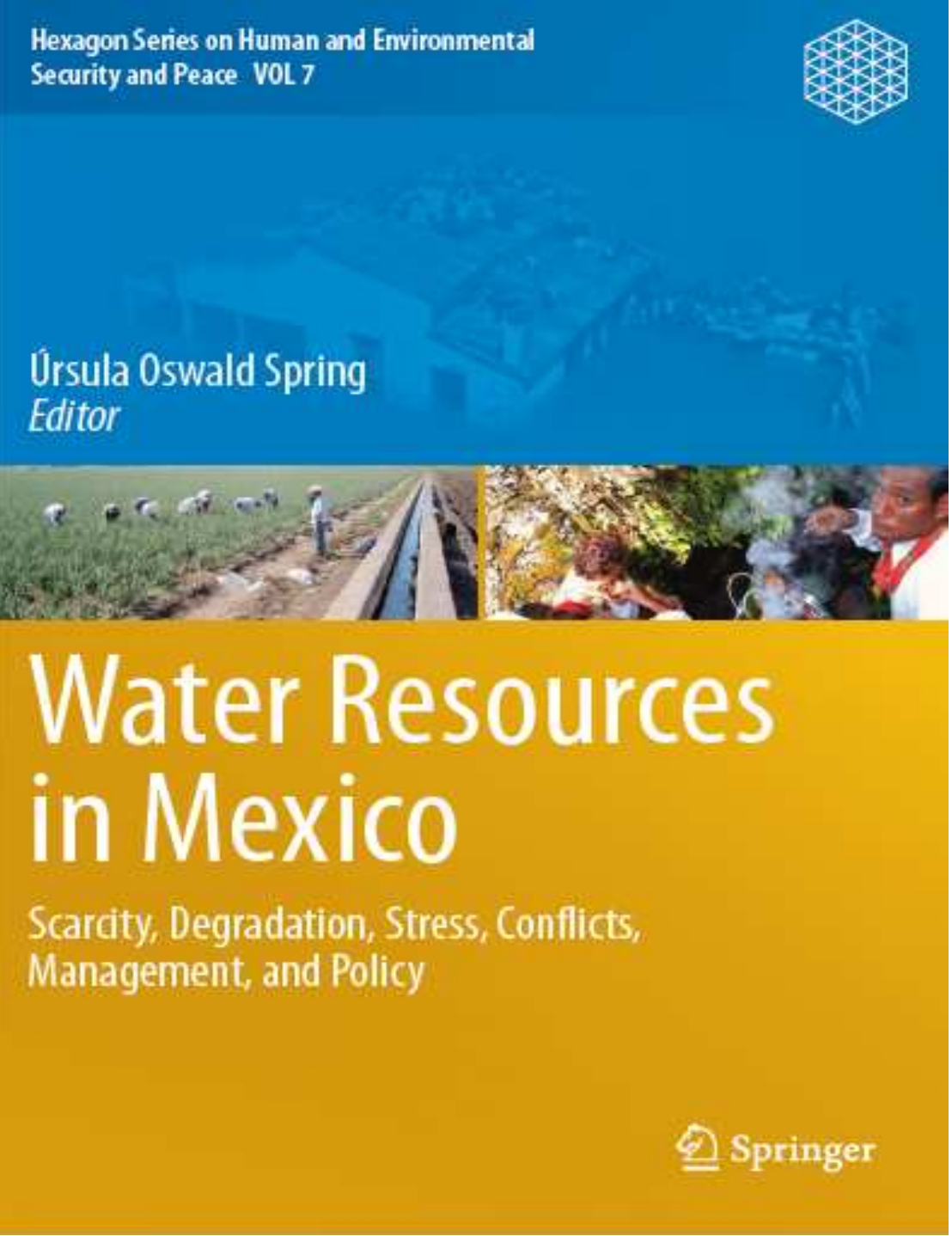


Book Launch

Úrsula Oswald Spring
CRIM-UNAM
National Coordinator of the Water Research Network,

Verbania, Lago Maggiore, Italy,
21st of September, 2011

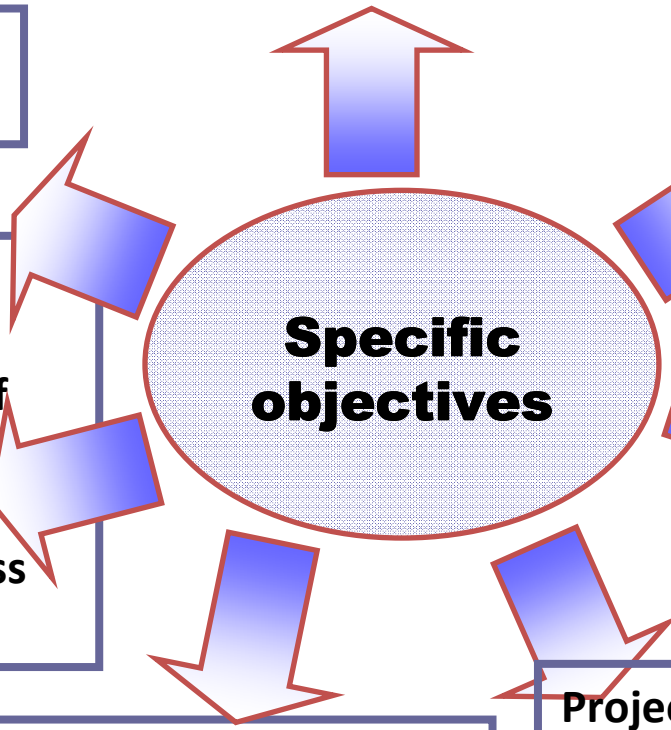
Index of the Book

Summary

- Water resources in Mexico are threatened by **scarcity, pollution, and climate change**. In **two decades** water consumption has **doubled**, producing water stress in dry seasons and **semi-arid and arid** regions. Water stress is rising due to physical and economic stress. In seven parts a multidisciplinary team analyzes hydrological processes in basins and their interaction with climate, soil, and biota. **Competing water use** in agriculture, industry, and domestic needs requires **savings, decontamination processes, and desalination** to satisfy the growing demand. Water **quality affects health and ec**osystems. This creates **conflicts and cooperation** that may be enhanced by **public policy, institution building**, and **social organization**.

Water research network in Mexico

Elaboration of a scientific and technological state of art of water research, institution, business, and define urgent research themes



State of art in water research in Mexico

National and international sources of financing

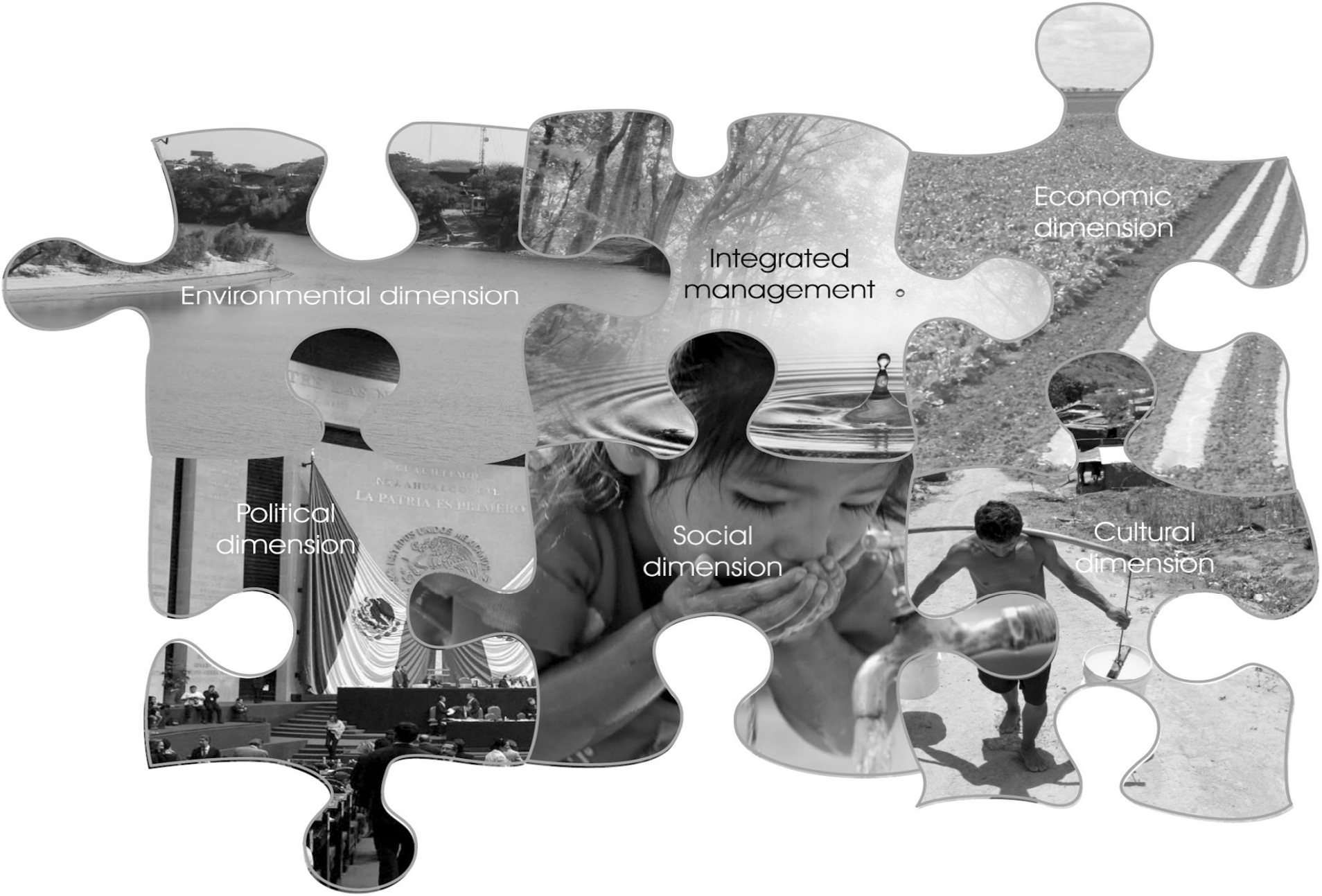
Catalogue of:
-Human resources
- Capacity for formation of new resources
- Infrastructure in collaboration with business an government

Potential projects feasible to link up with public and private sector (business with environmental ethic)

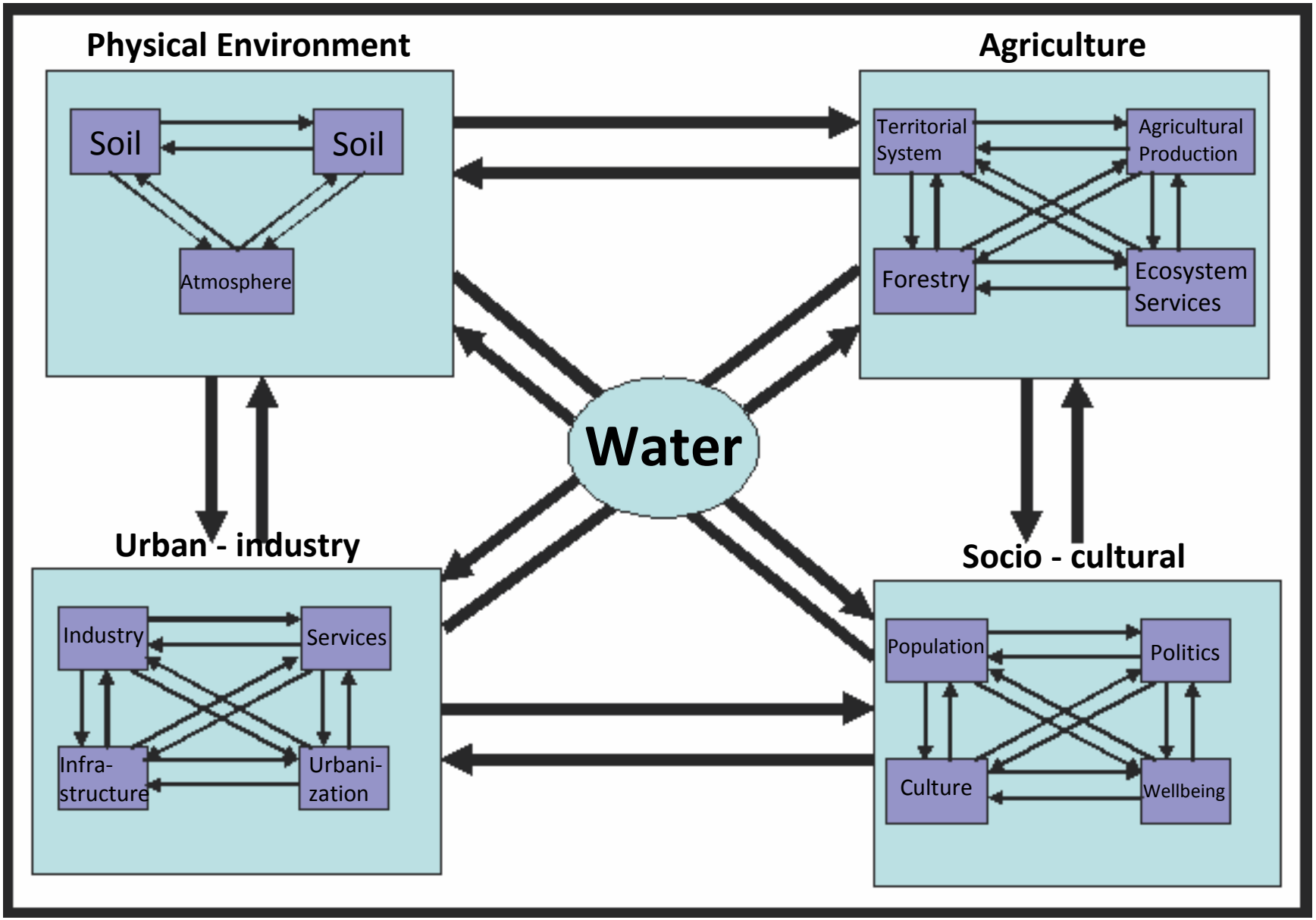
Multi-institutional and interdisciplinary projects relating problems from basic science, engineering, integral basin management, ecosystem services and sustainable water culture

Projects oriented to resolve or create conditions to tackle strategic problems of Mexican society in cooperation with government and business for water management

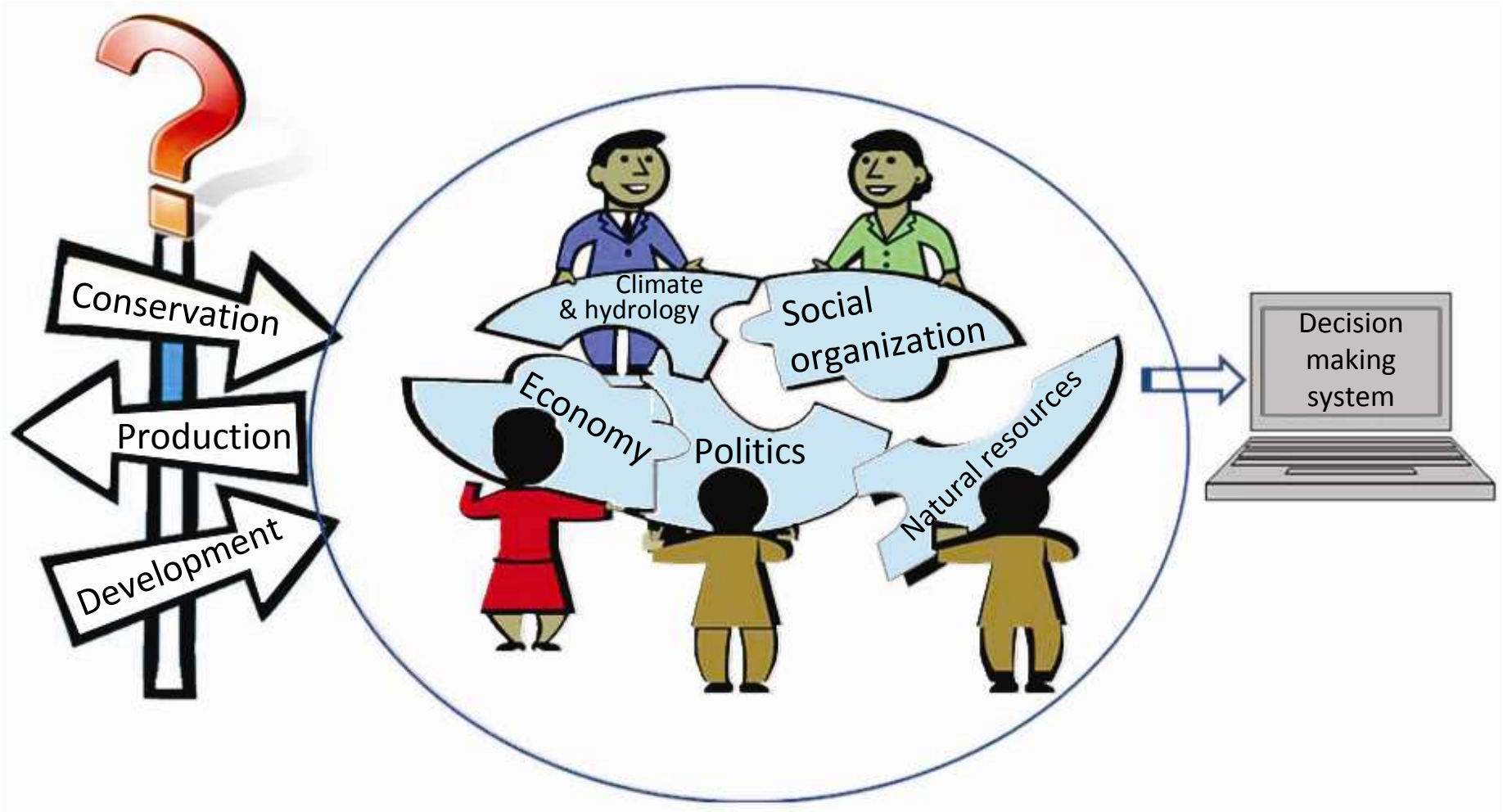
Integrated water management



System approach of an integral water management and sustainable development (Oswald, 2005)

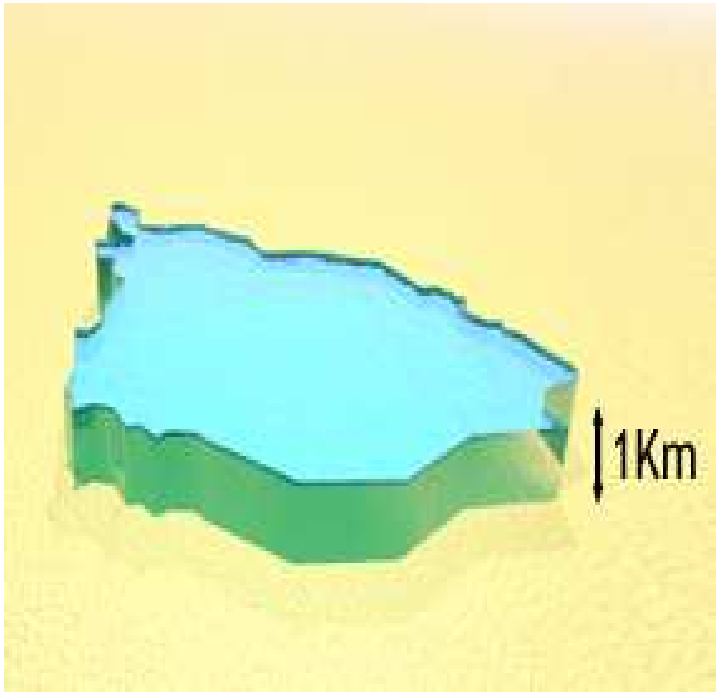


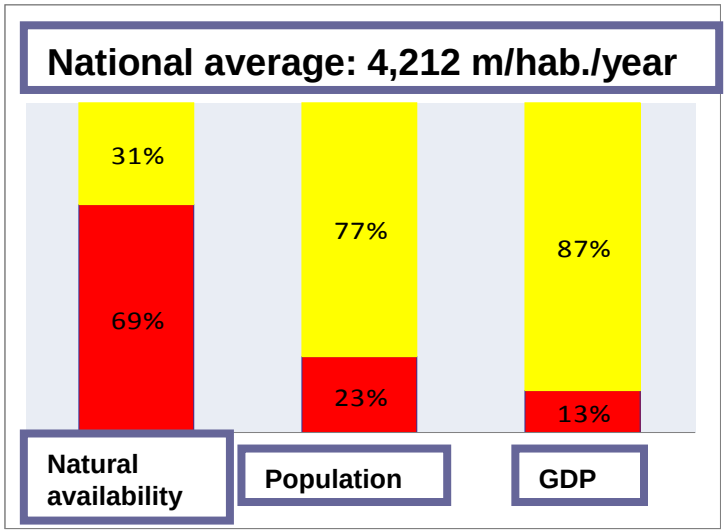
Multidisciplinary, multi-sectorial and multi-institutional research



Part 1: Hydrological processes, management of basins & availability

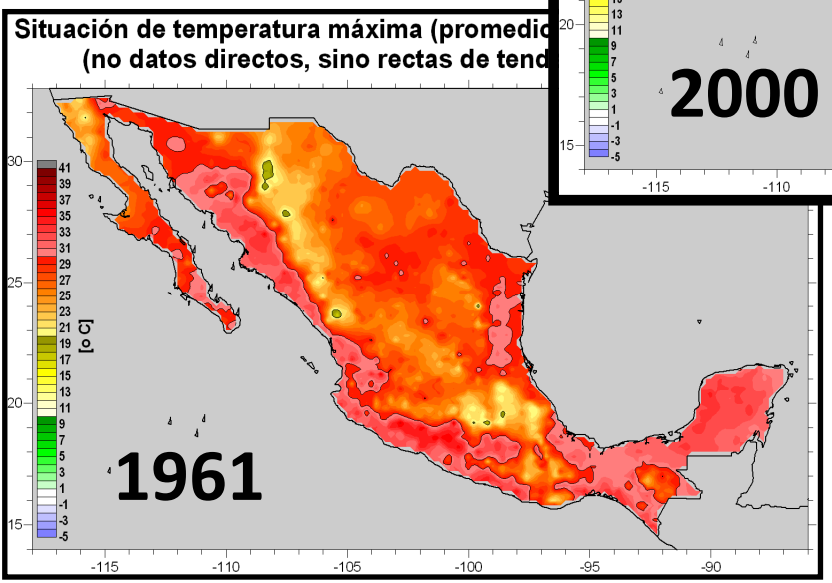
Precipitation, population and use of water

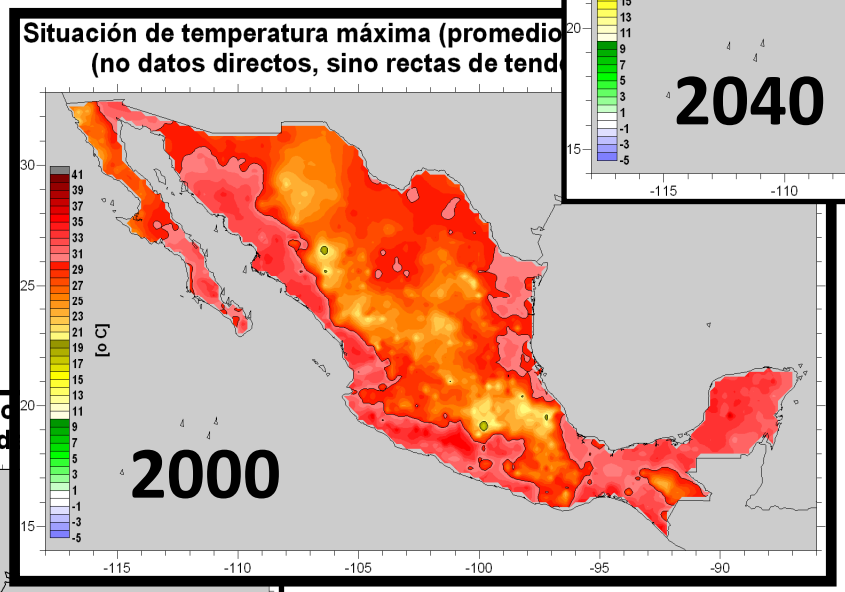


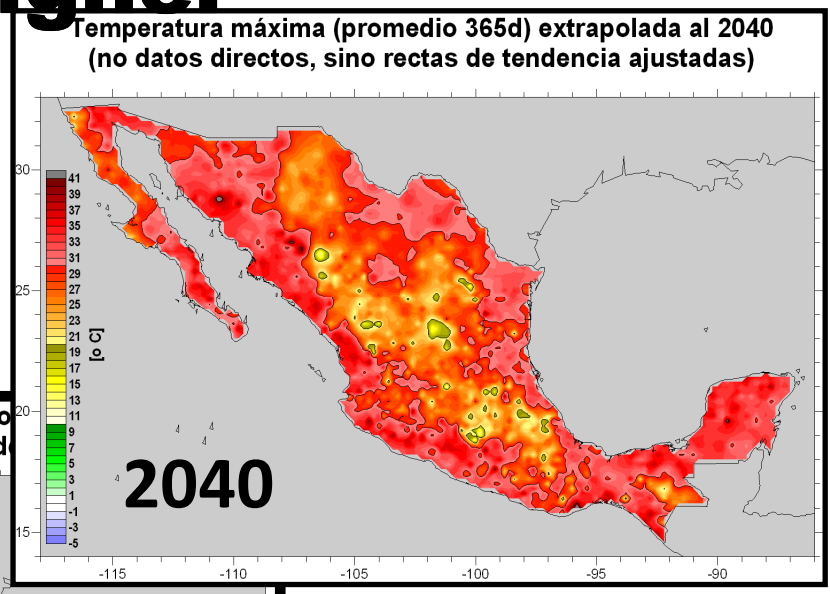


- Precipitation average per year in Mexico: 1522 km3 equivalent to a swimming pool of 1 km deep and the extension of Mexico City.
- 72% (1084 km3) of this water evaporates
- Average: 711 mm/year
- North: only 25% of precipitation
- 27.5% get to south and south-east; 49.6% in the poor states of Chiapas, Oaxaca, Campeche, Quintana Roo, Yucatán, Veracruz and Tabasco
- 67% of rain during June to September

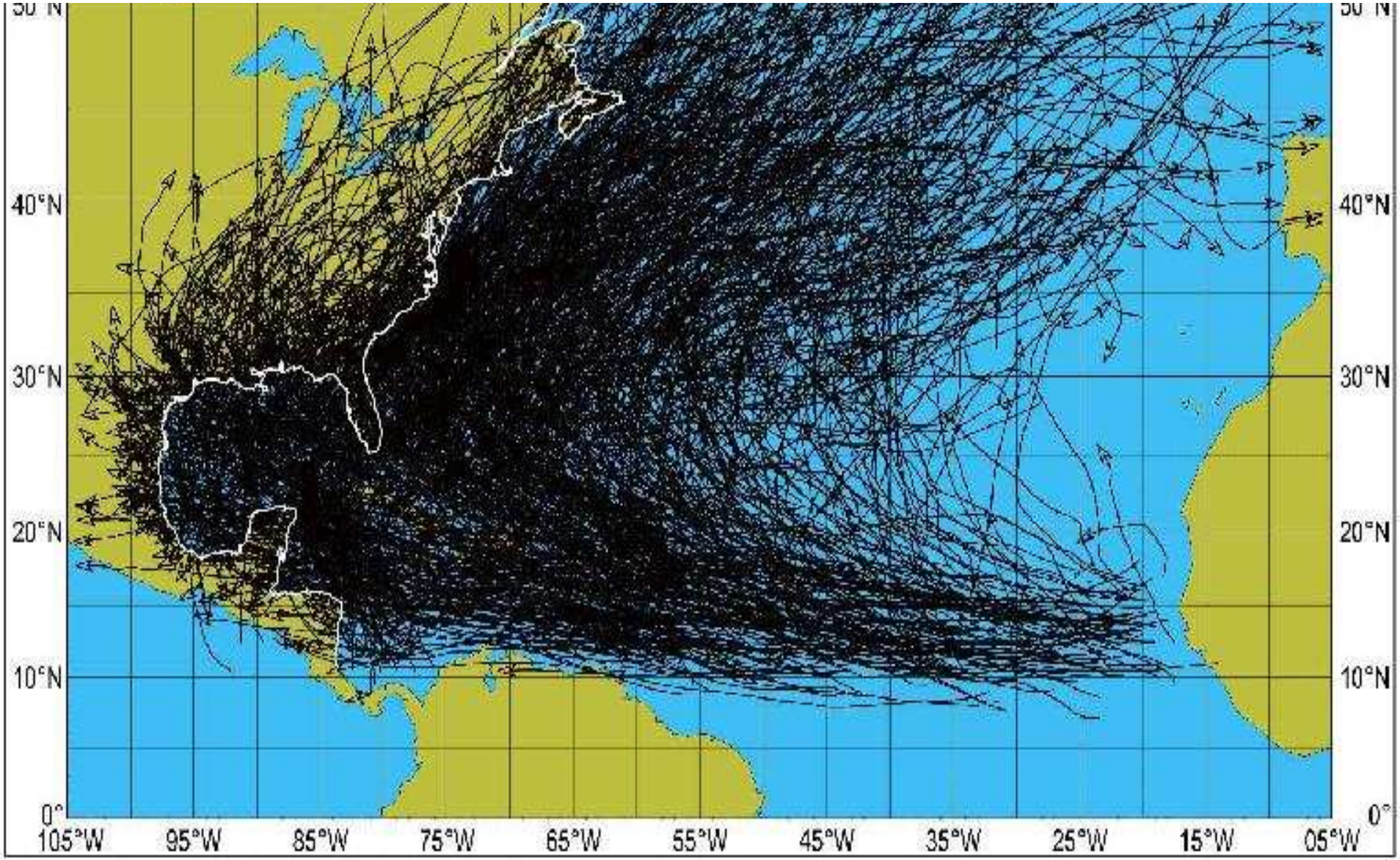
Climate change and higher temperatures





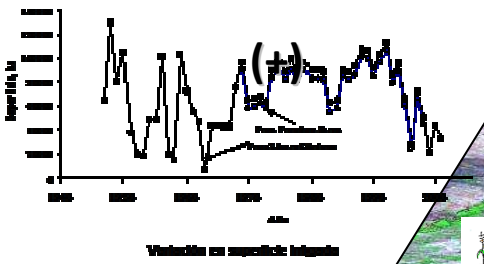


Paths of hurricanes during the 21st century



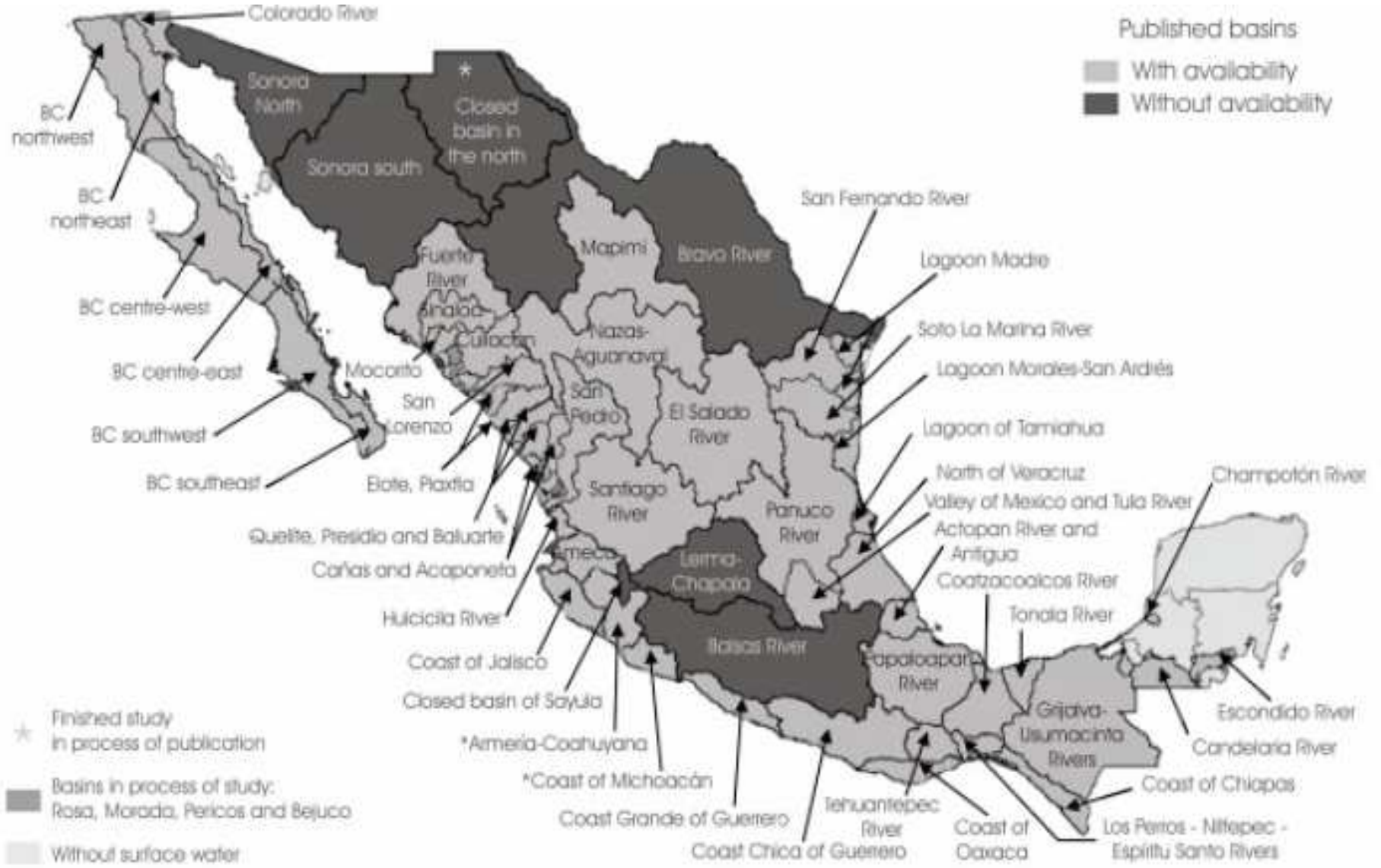
Cascade impacts: Crops resistant to drought

10cm of less water for irrigation in one hectare signifies a ***reduction of 1000 m3 of water,*** suficient to supply water for 4,000 people.

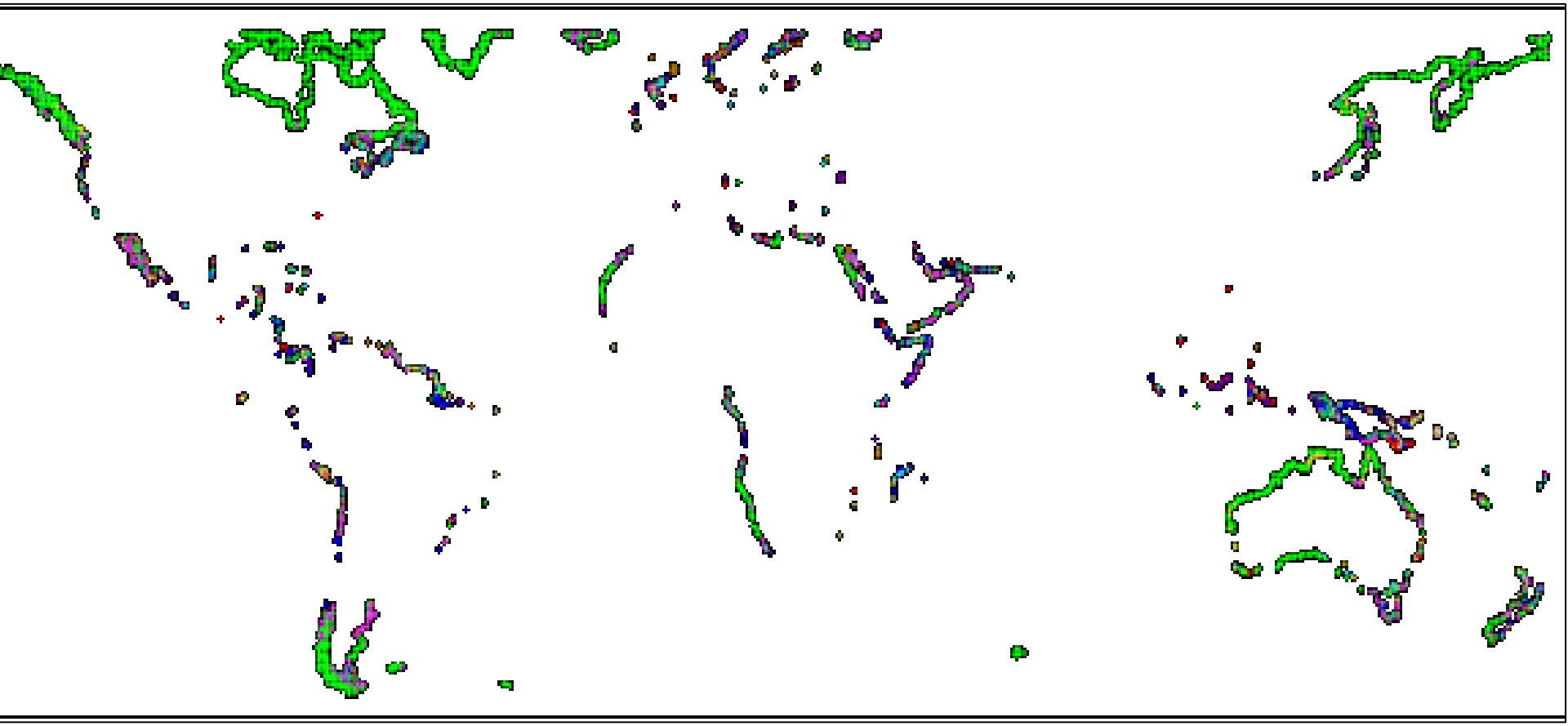


Relation: biotechnology, genetic, hydrology, agriculutre sociology, economy, health, livelihood, poverty alleviation, etc.

Water basin in Mexico



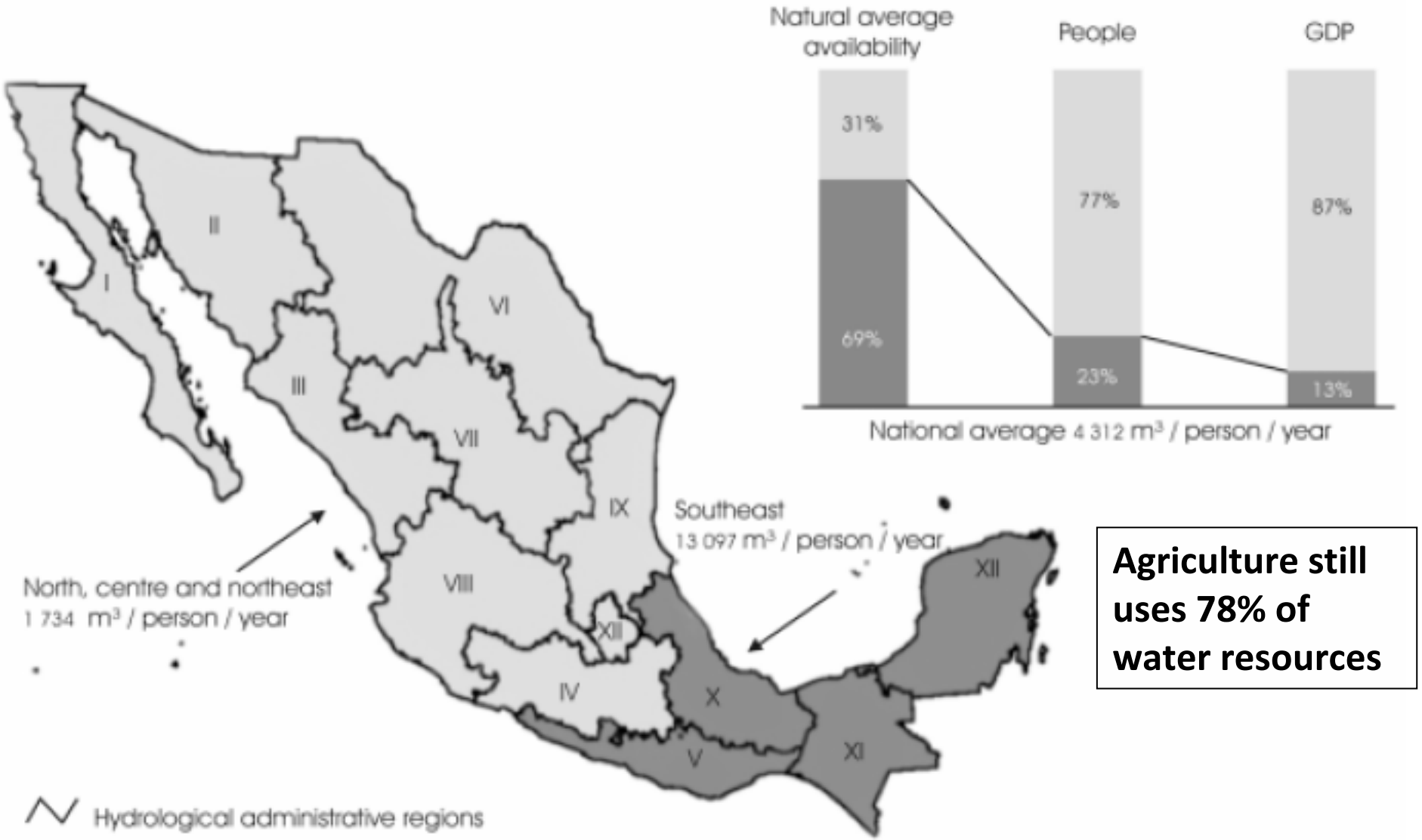
Rise of sea level and erosion of coasts



Buddemeier 2001

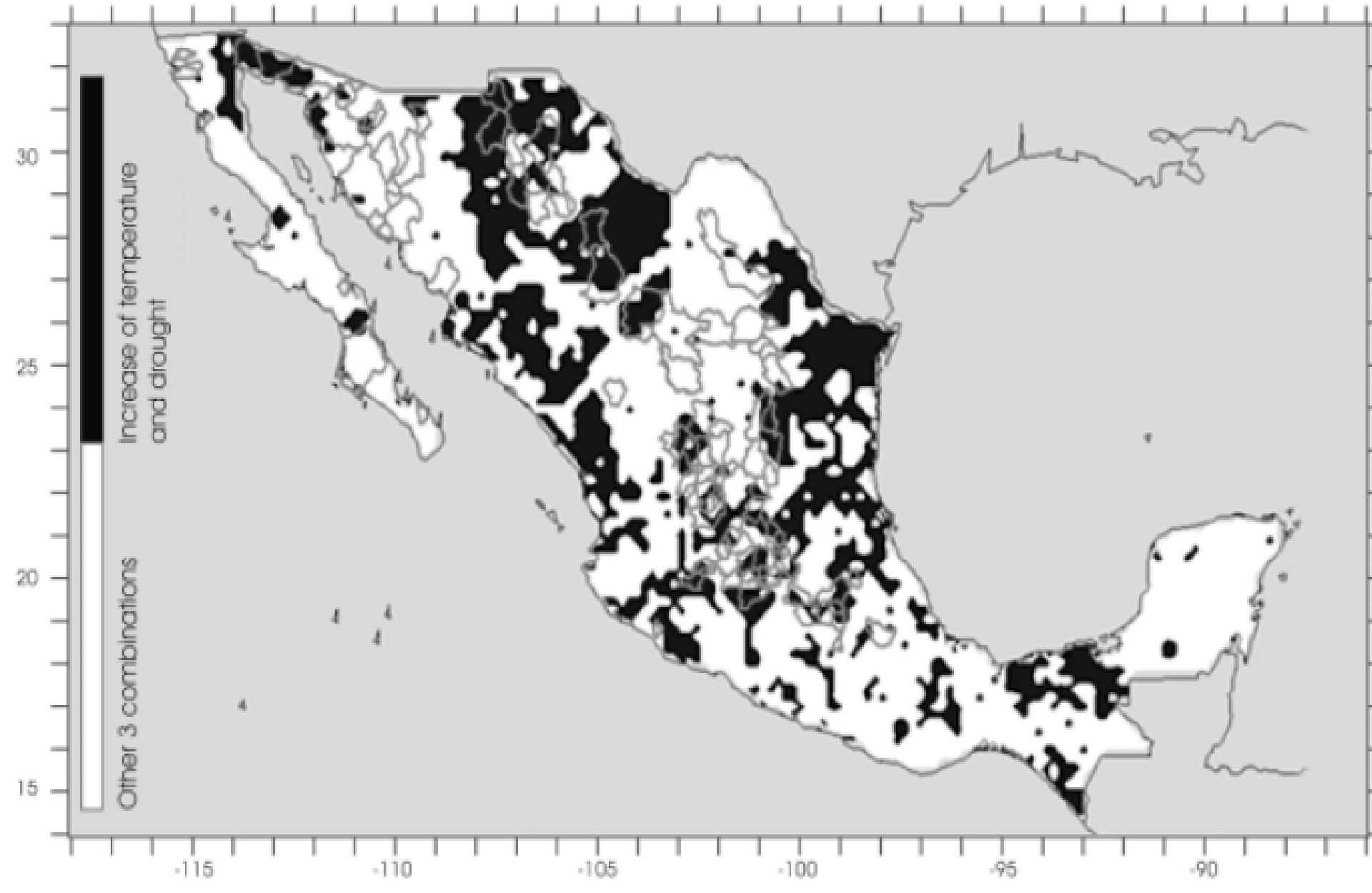
Part 2: Water use, availability and alternative sources: Imbalances

Imbalances of water, population and GDP

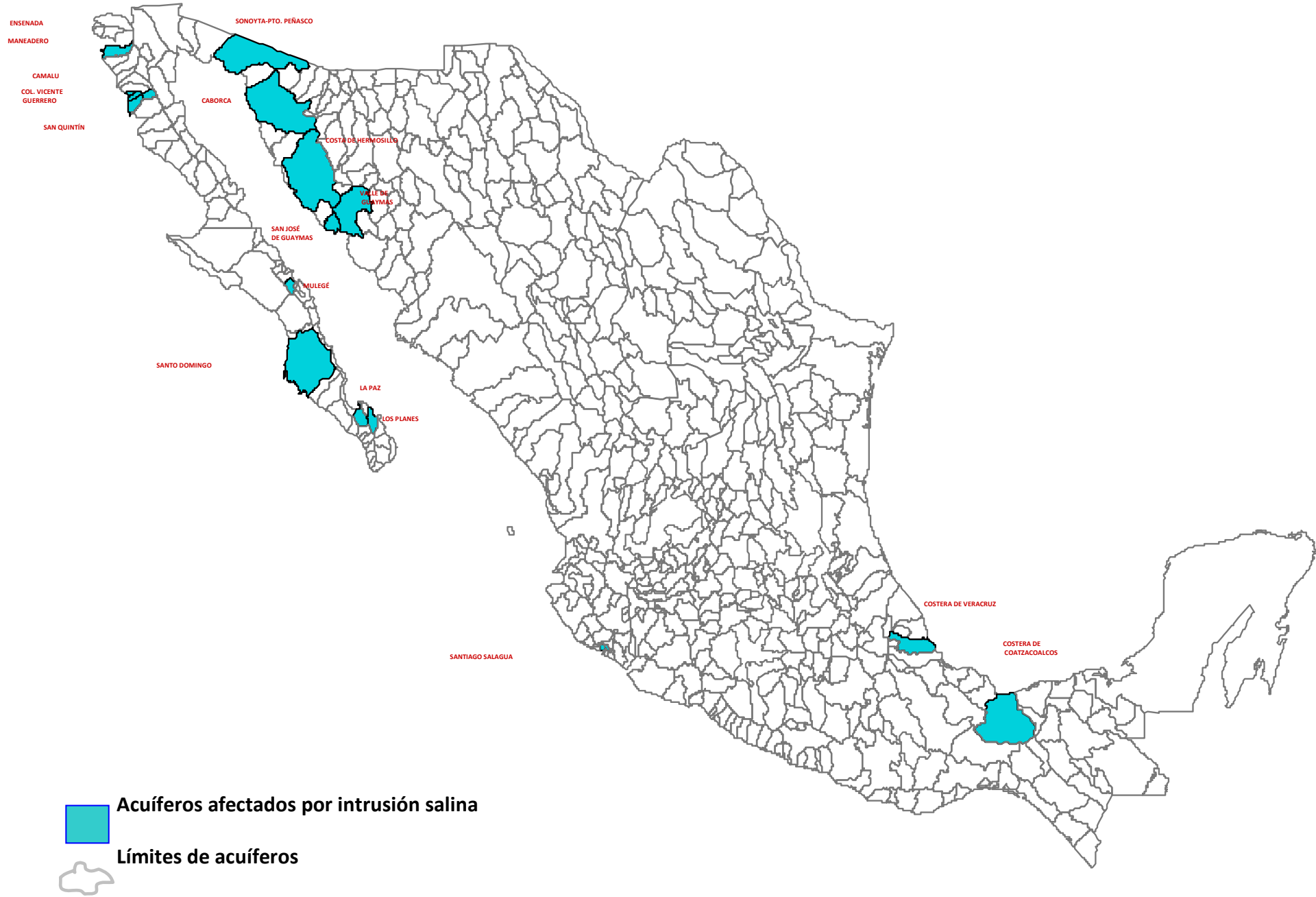


Agriculture still uses 78% of water resources

Overexploited aquifers

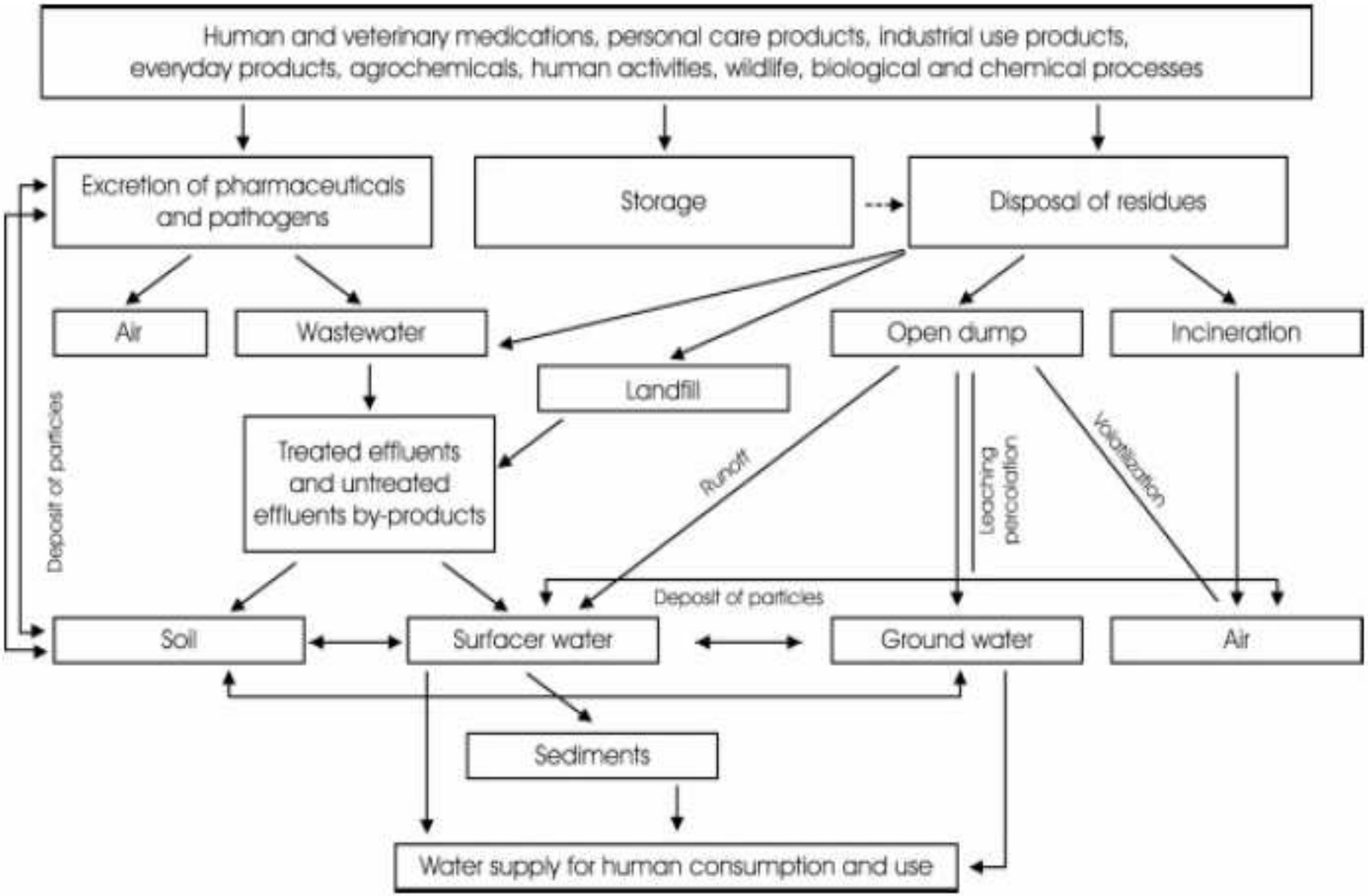


Intrusion of sea water into aquifers

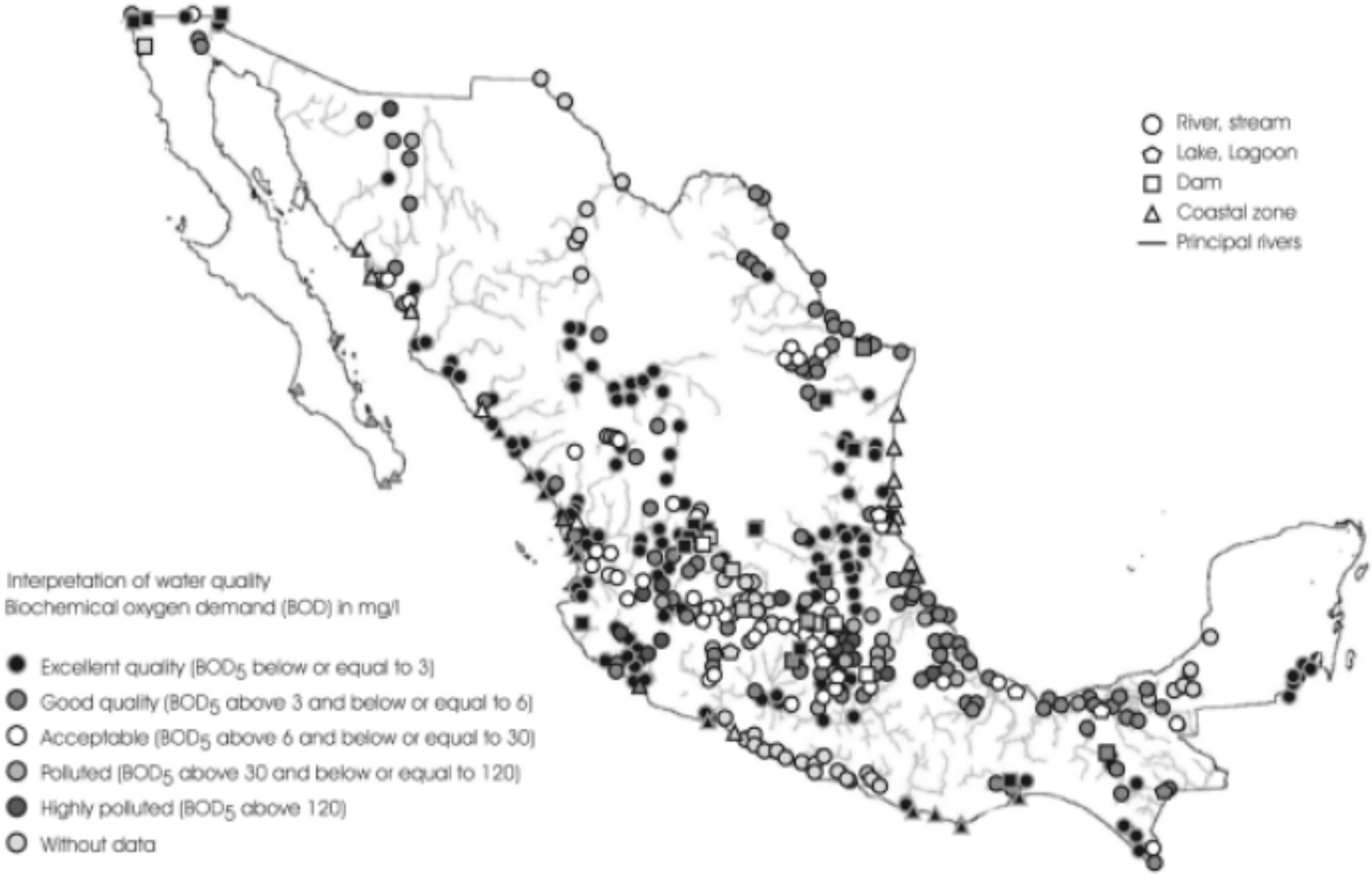


Part 3: Water quality, pollution and health

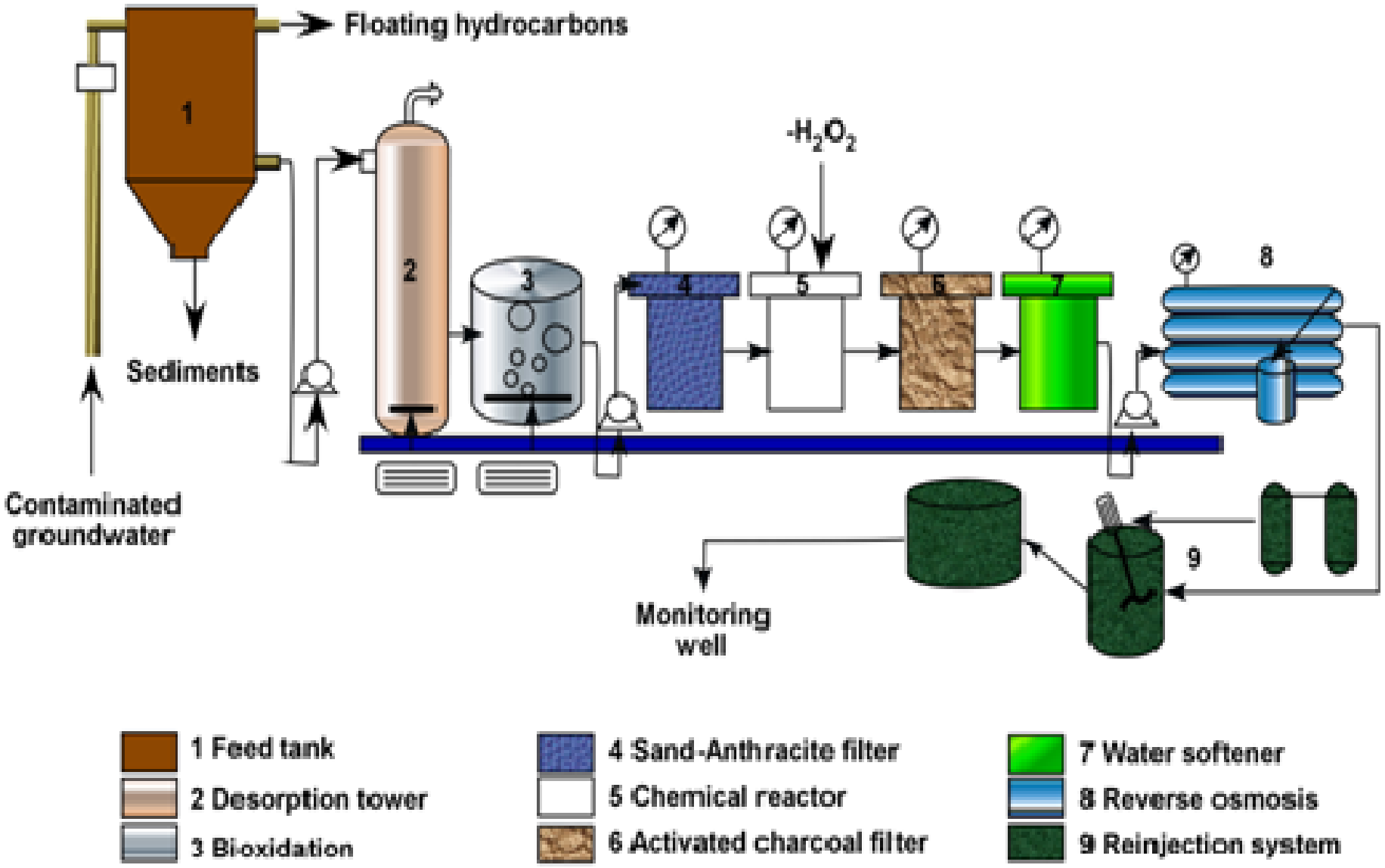
Processes of pollution



Biochemical Demand of Oxygene

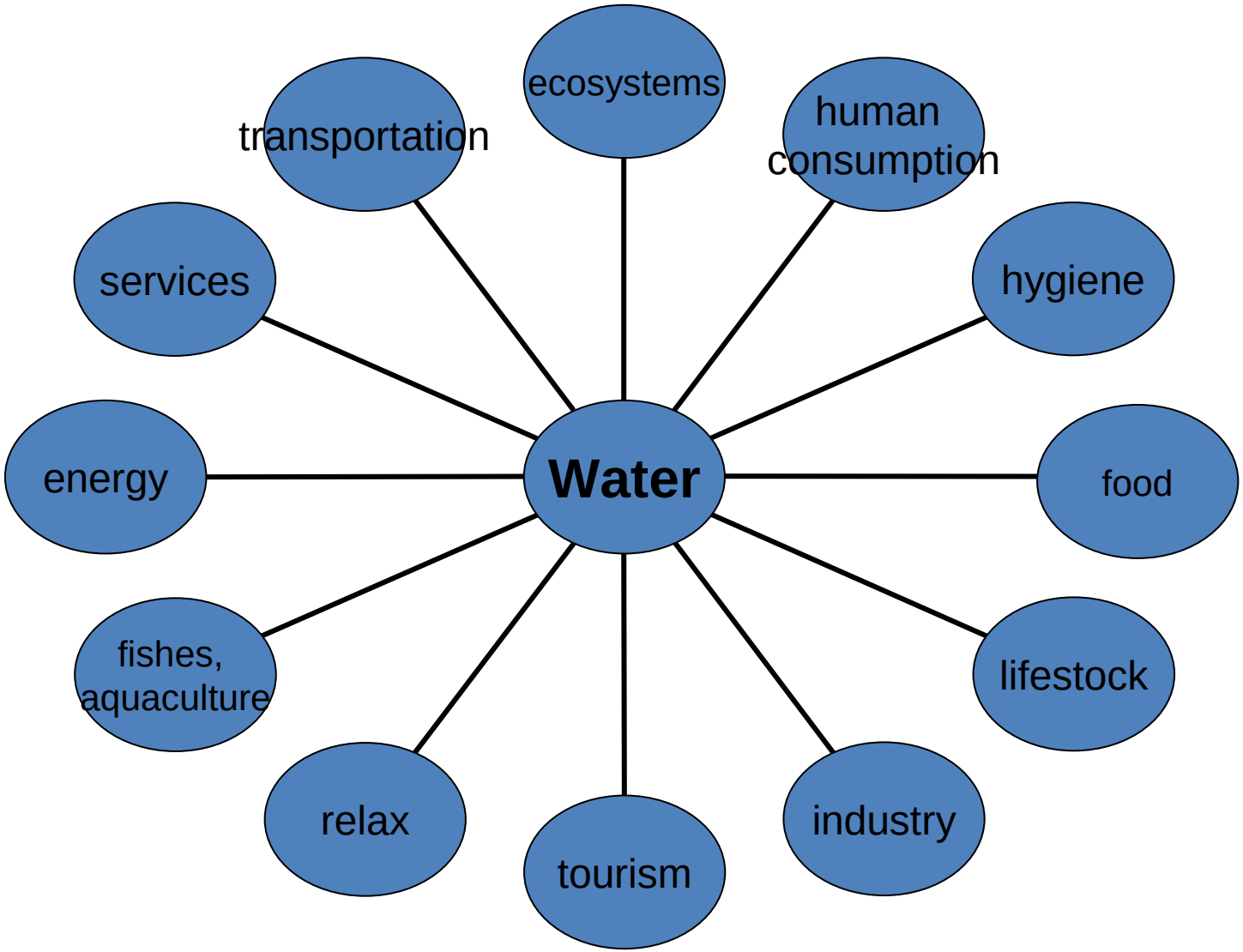


Hydrocarbon remediation



Part 4: Social effects, conflicts and hydro-diplomacy

Uses of Water



Source: Oswald 2007

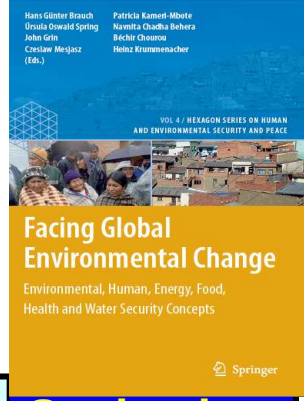
4. Water Security: a controversial concept

- **One common goal:** *to provide water security in the 21st Century:*
  - This means ensuring that freshwater, coastal and related ecosystems are protected and improved;
  - sustainable development and political stability are promoted;
  - every person has access to enough safe water at an affordable cost to lead a healthy and productive life
  - the vulnerable are protected from the risks of water-related hazard
- Water resources are under **threat** from pollution, overexploitation, land-use changes, unsustainable use, climate change and other anthropogenic forces.
- Links between threats and poverty: the poor who are hit first and hardest (slum dwellers without basic services).
- One simple conclusion: **business as usual is not an option.**

Human, Gender, Environmental Security

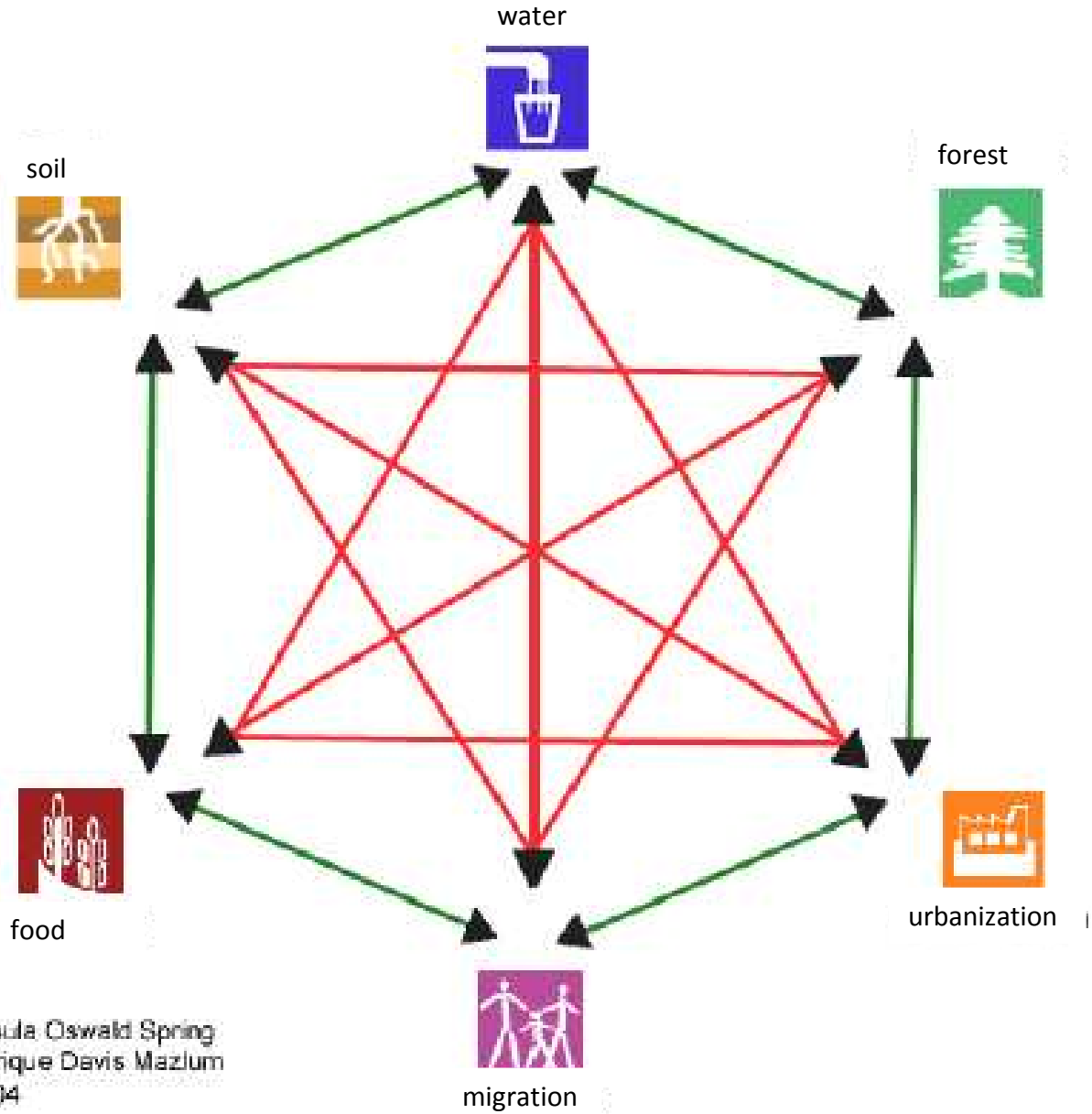
Determination Which security?	**Reference object:** Security of whom?	**Value at risk:** Security of what?	**Source(s) of threat:** Security from whom or what?
National security	The State	Territorial integrity	State, substate actors
Human security	Individual, humankind	Survival of humankind people	Natural events, state, globalization
Environmental security	Ecosystems, rural and urban systems, water and food	Sustainability, food, wellbeing, health	Humankind, extreme hydrometeorological events
Gender security	Gender relations, indigenous people, minorities	Equity, identity, social relations, solidarity, tolerance, culture	Patriarchy, totalitarian institutions (élites, governments, religious fundamentalism, dominant cultures), intolerance, violence

Widening, Deepening and Sectorialization of Security Threats and Risks

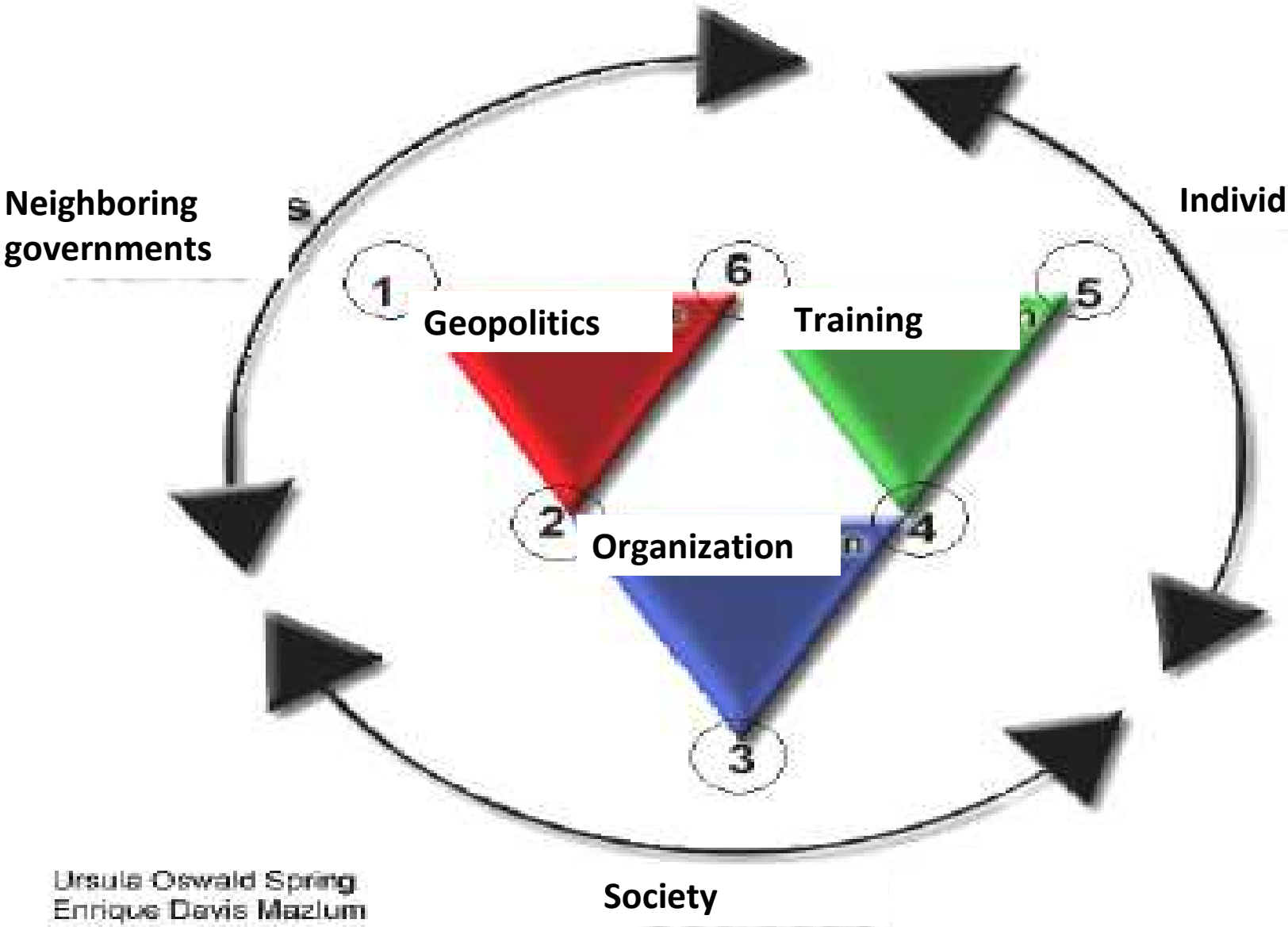


Security dimension⇒ ⇓ Level of interaction	Mili-tary	Politi-cal	Economic	Environ-mental ⇓	Societal
Human individual Human security ⇒	Land mines	Failed state	Food & Health security	Cause & victim	Food & Health security
Societal, community security	Border control	Public security	Water, Food & Health sec.	↓↑	↓↑
National security	During Cold War shrinking (in USA since 2001 ↑ & since 2009 ↓)		Energy security	↓↑	Energy Food, Water & Health security
International and Regional security			Water security	↓↑	Water security
Global and planetary security ⇒	Terro-rism	Intern. migration	Financial crisis	CC; GEC; biodiversi-ty loss	Health security

Conflicts related to water

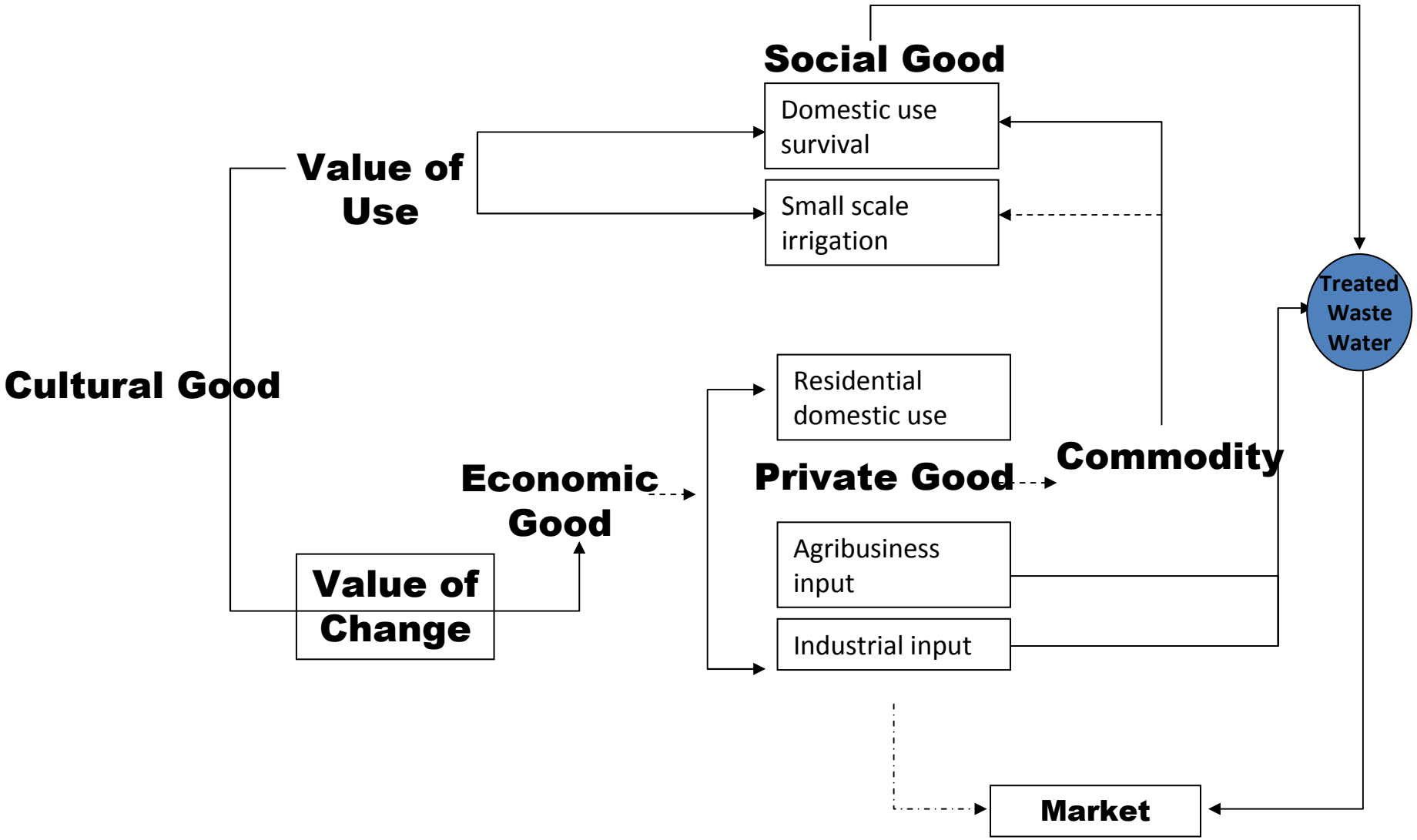


Hydrodiplomacy



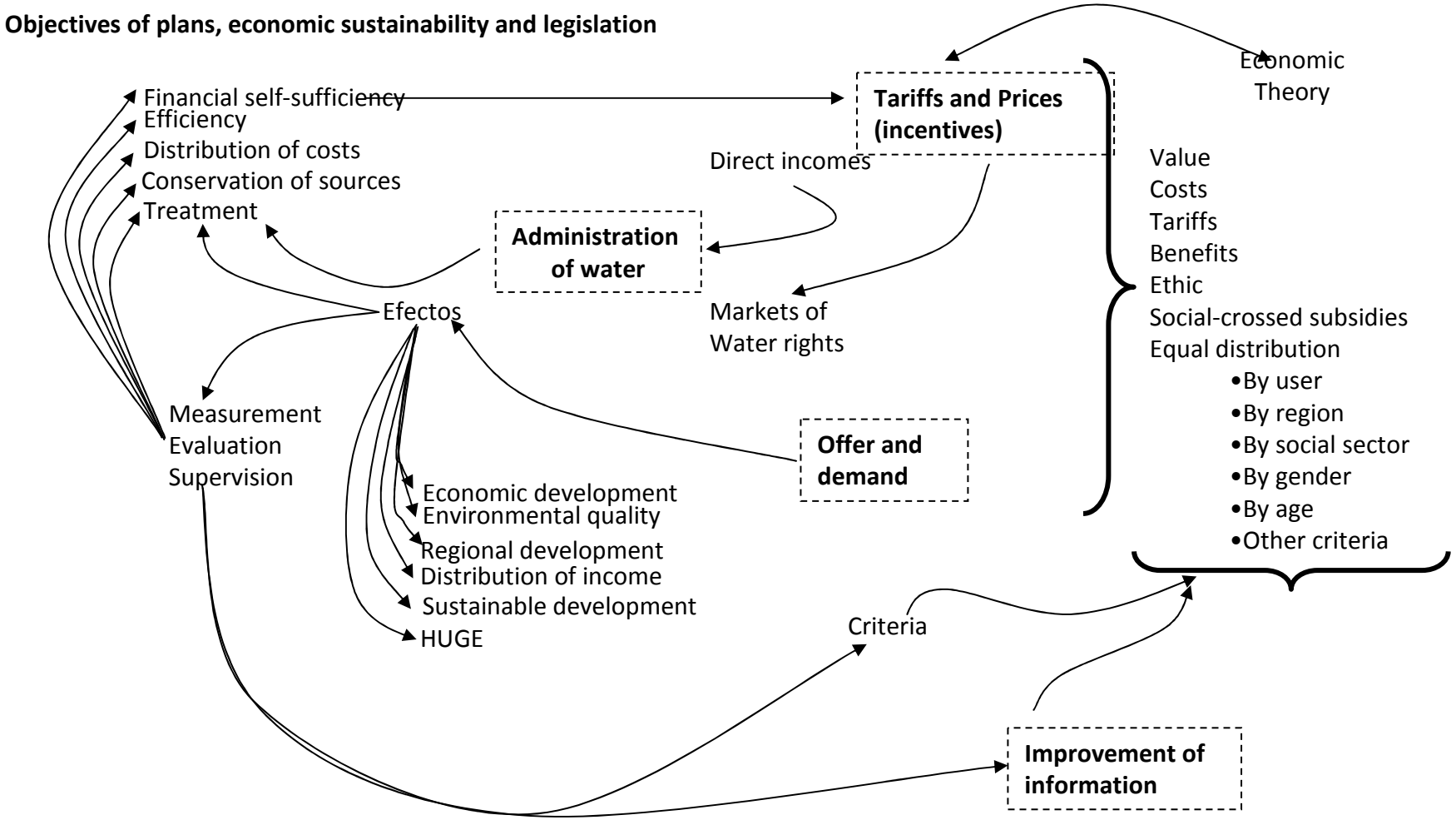
Part 5: Public policy, institutions, legal aspects & economy of water

Logics of Value of Water



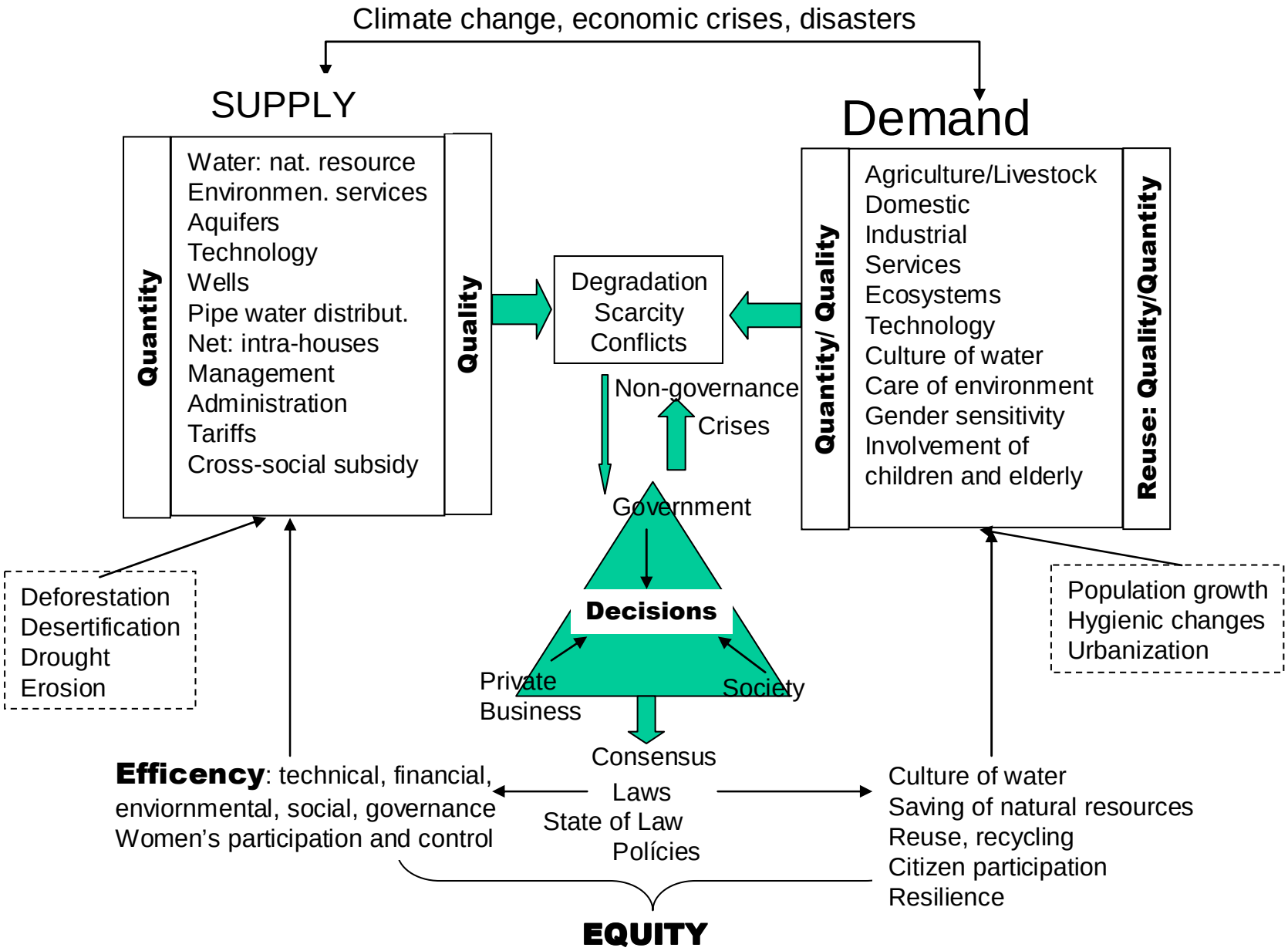
Source: Ramos 2004: 101 modified by Oswald 2005: 147

Economy of Water



Source: Sandoval 2000, modified by Oswald 2005: 153

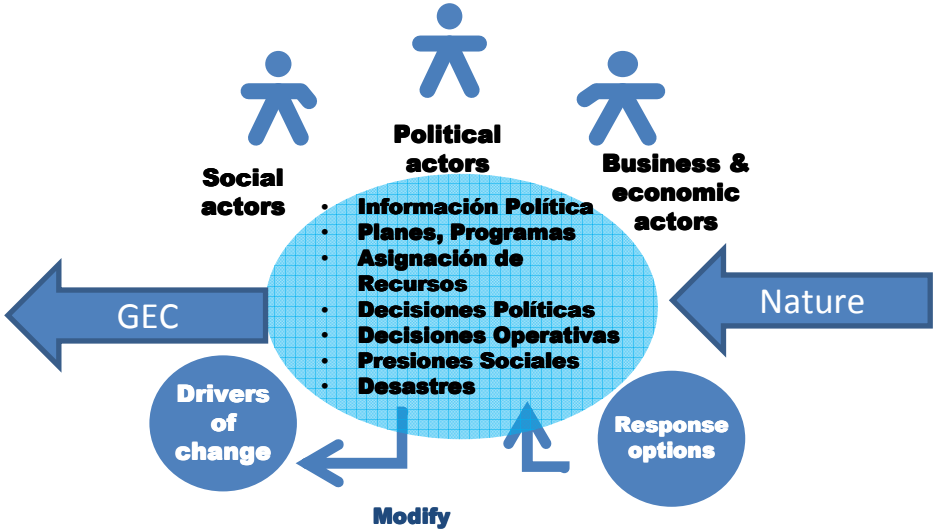
Efficiency and Equity with Natural Resources



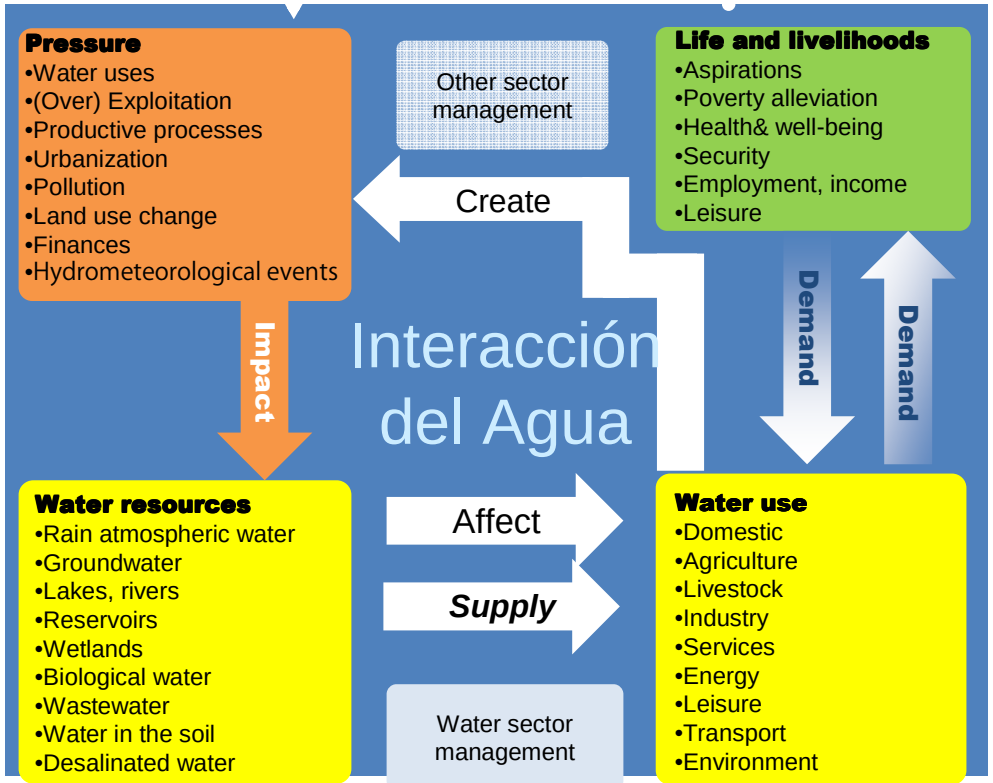
Fuente: Oswald y Sandoval, 2006

CEG: Global Environmental Change:

- Demographic
- Urbanization
- Food
- Social organization
- Economy and finance
- Policy & law
- Technology
- Environment
- Hydrometeorological events



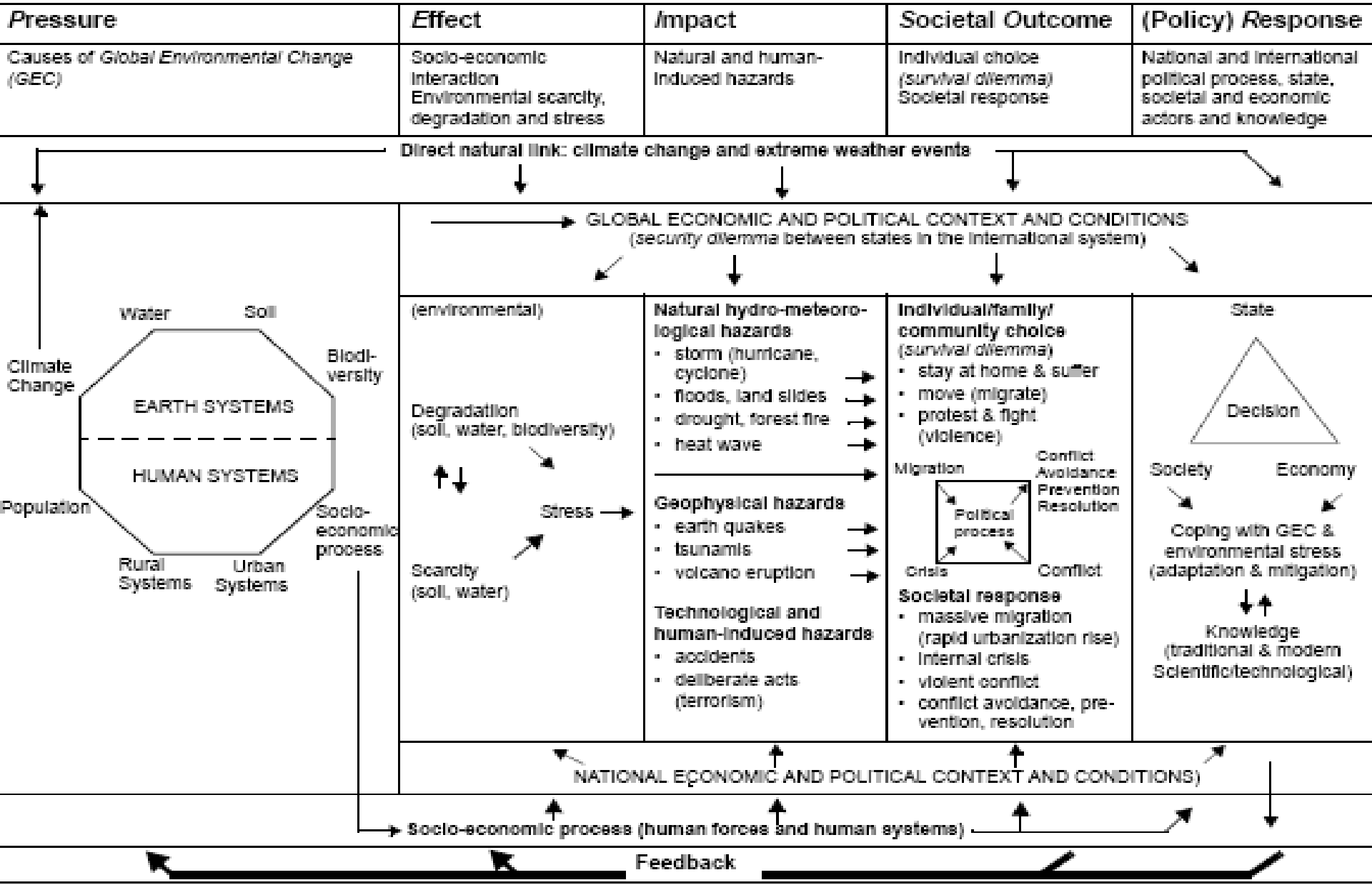
1. Systemic model of water decision-making processes



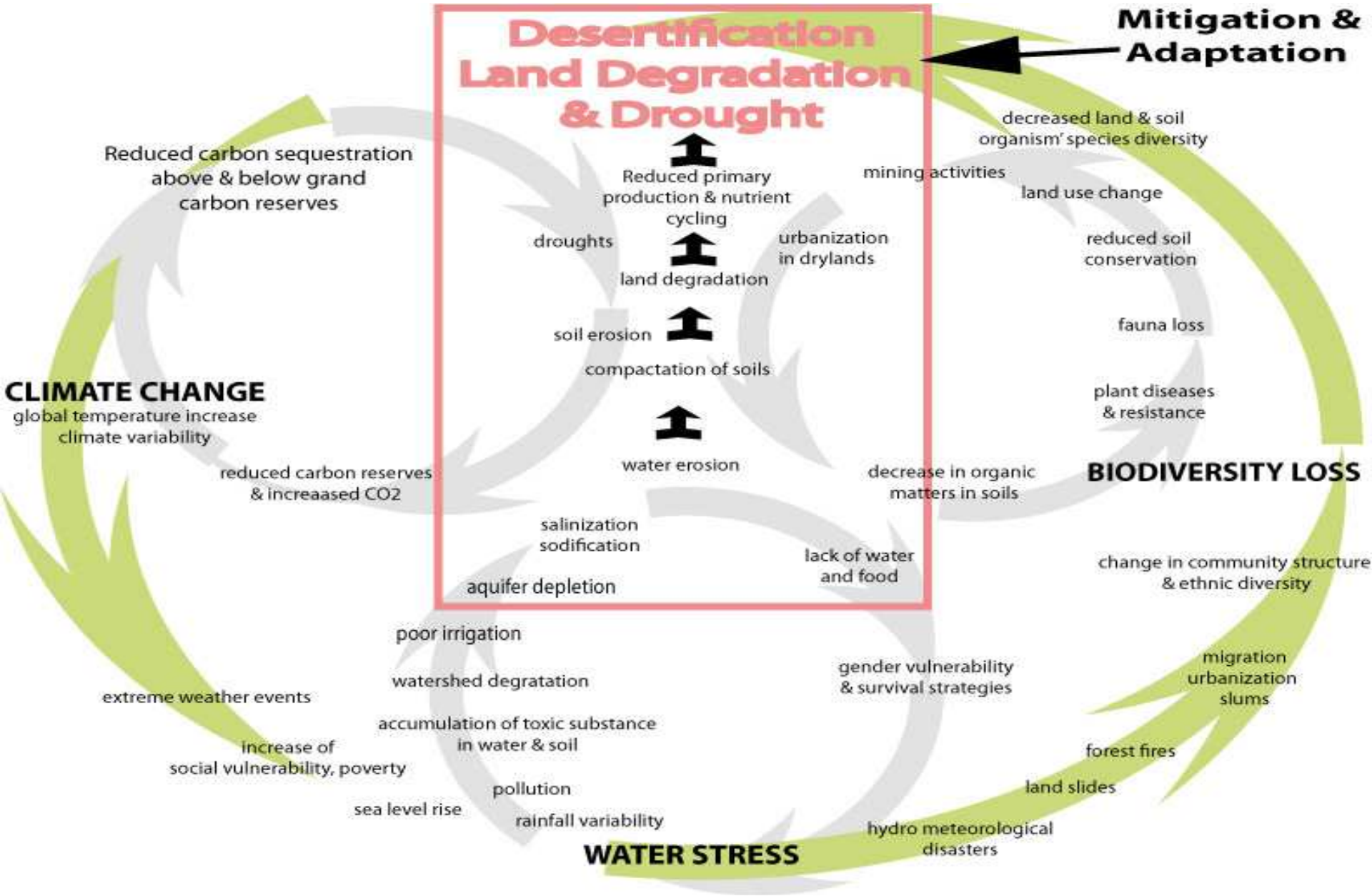
Sources: based on Global Water News, #9, p. 4

Conclusions: an integral approach to the culture of water and GEC

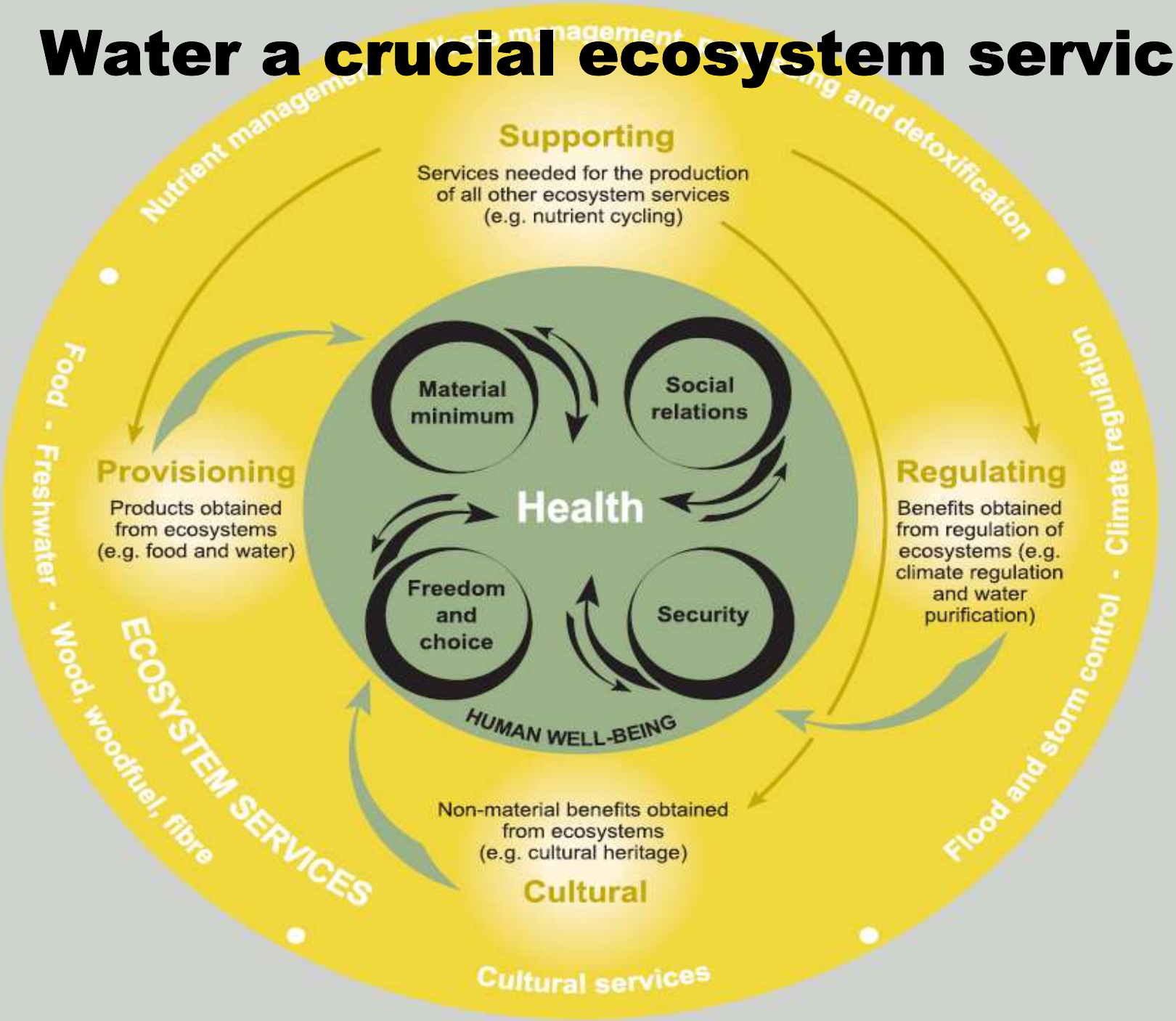
The PEISOR Model



Complex interactions of GEC



Water a crucial ecosystem service



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