

SEMANA TEMATICA 4: El Agua, Recurso Único

Los Desafios de de la Gobernanza Global del Agua El Agua en un Contexto Ambiental Global

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THEMATIC WEEK 4: Water, a Unique Resource Ún

The Challenges of Global Water Governance Water in a Global Environmental Context

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Main factors, external to the physical water system, influencing water use

- Demographic evolution
- Globalization
- Economic development
- Value of human capital
- Action of international and intergovernmental cooperation institutions
- Information and communication systems
- Scientific and technological progress

Paradigms of modern water management

- Paradigm of industrial modernity (late 19th Century)
- Environmental paradigm (1960s)
- Economic paradigm (1990s)
- Political institutional paradigms (late 1990s)
- Global paradigm (current)

Water Governance

- **Governance** is the way in which traditions and institutions balance power in administration
- **Water Governance** refers to the range of political, social, economical and administrative systems that are in place to develop and manage water resources and the delivery of water services at different levels of society

Source: Global Water Partnership, 2002

- Water Governance determines **WHO** gets water, **WHICH** water, **WHERE** and **HOW**

Dimensions of Water Governance

- Social dimension *equitable use*
- Economic dimension *efficient use*
- Environmental dimension *sustainable use*
- Political dimension *equal democratic opportunities for stakeholders and citizens*

Levels of water governance

- local level
- river basin level
- regional level (in boundary)
- national level
- regional level (transboundary)
- global level

Arguments in favour of a global water governance

- Working of the hydrological cycle and its interactions with other biogeochemical cycles
- Socio-economic impacts of regional water use may be felt globally
- World wide incidence of of socio-economic globalisation
- World wide incidence of global climate change

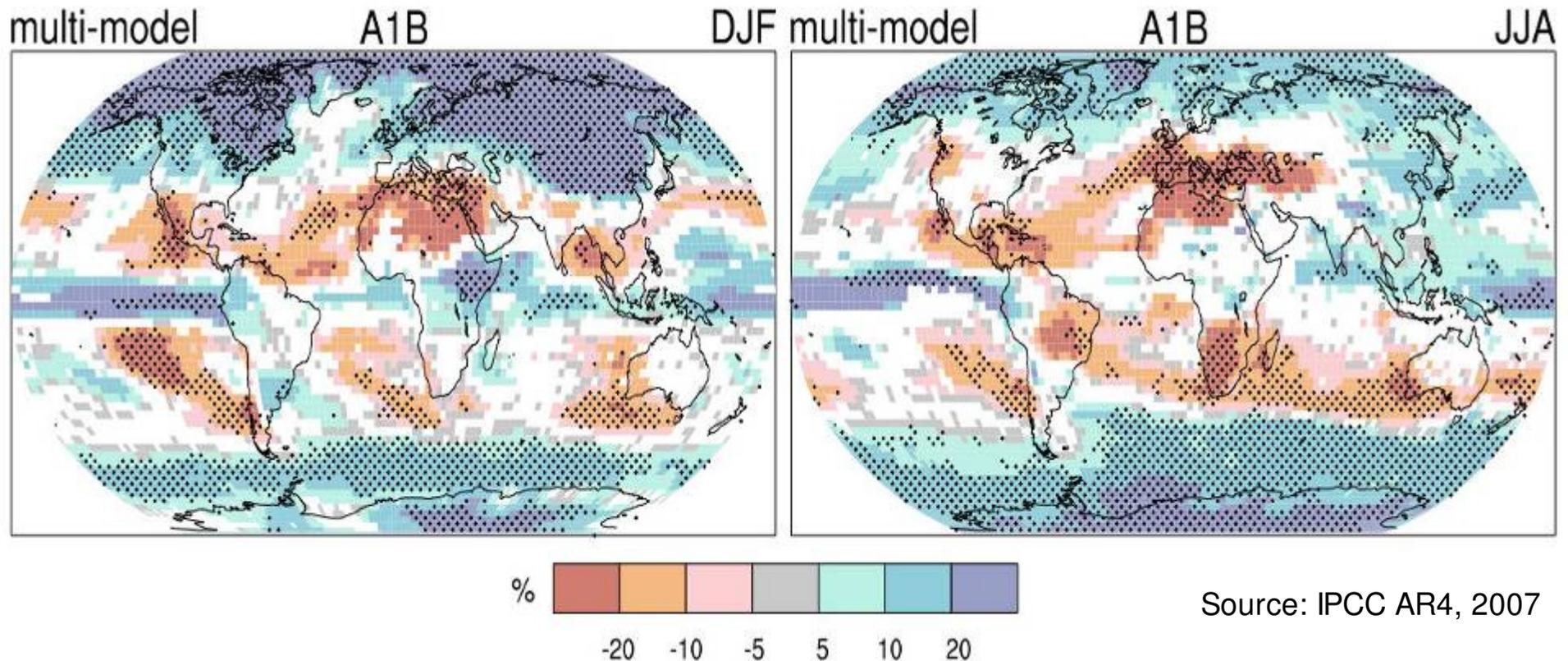
Climate change and Water

- Impacts of climate change on:
 - Water availability and water demand
 - Surface water and groundwater
 - Water quantity and water quality
 - Average availability and extreme phenomena
 - Freshwater and sea level rise

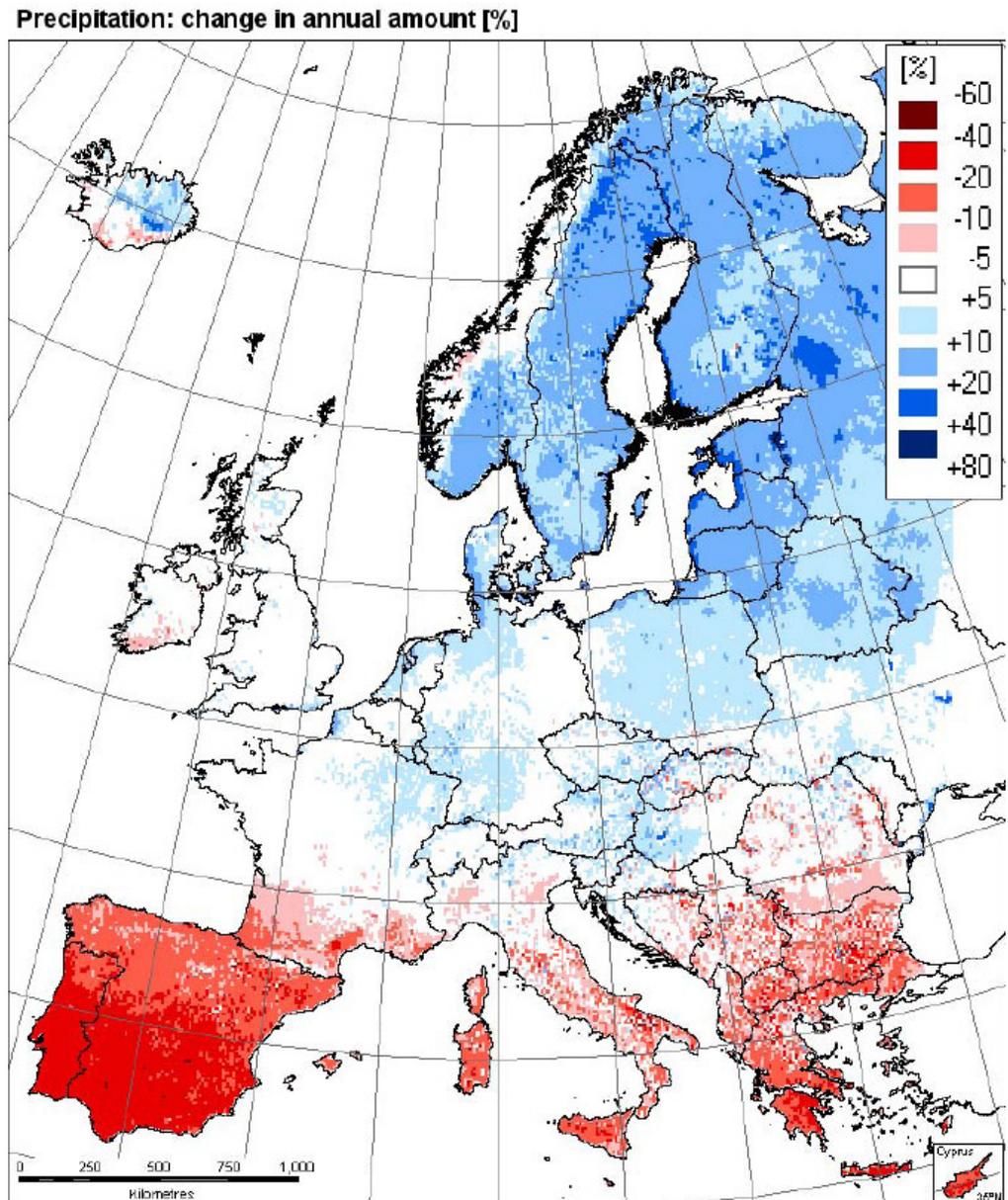
Water is a **main mediator** for impacts and adaptation measures in the different social and economic sectors

Precipitation change (%) for 2090-2099

- White areas – less than 66% of the models agree
- Dotted areas – more than 90% of the models agree

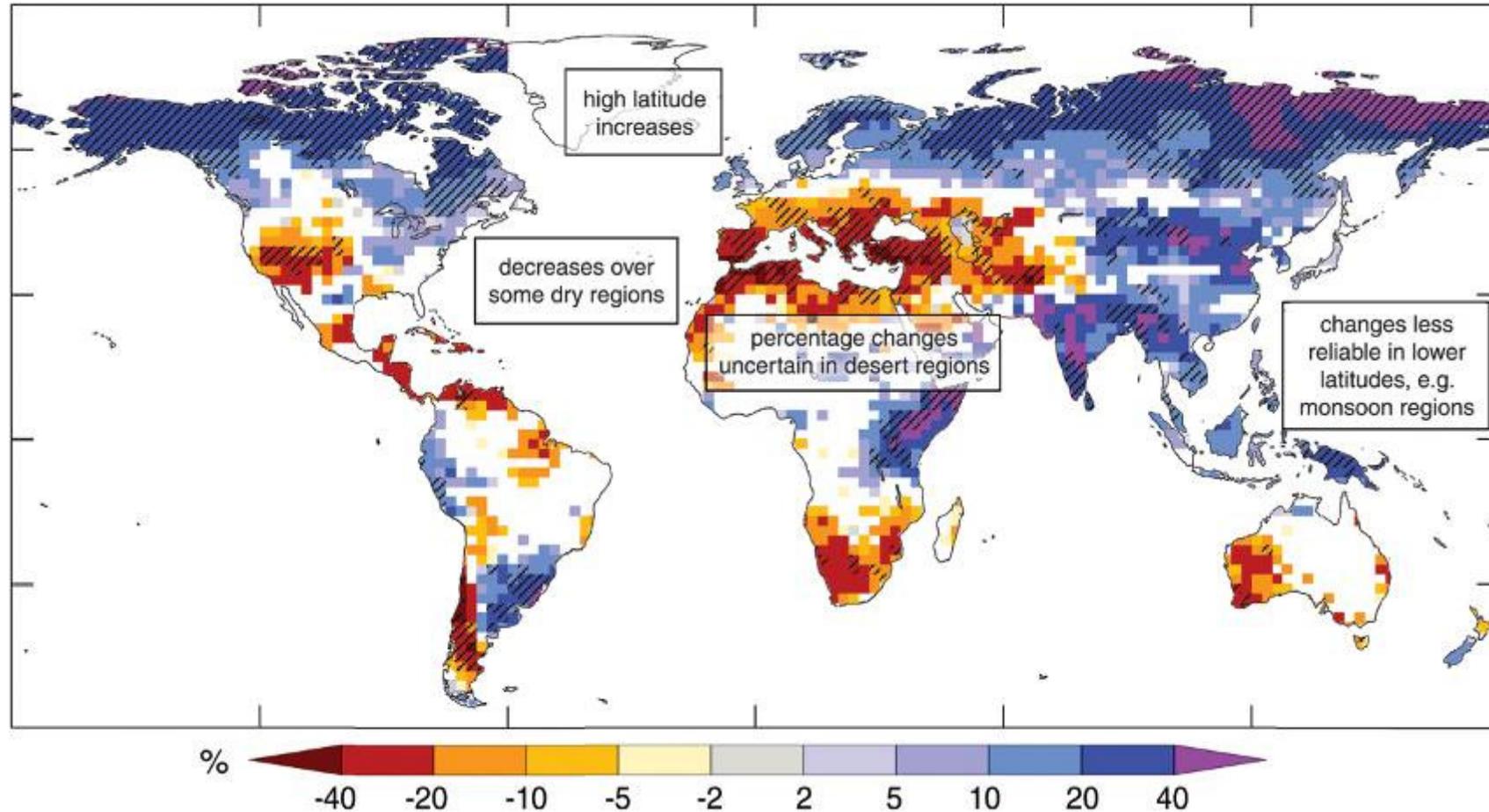


Precipitation change (%)



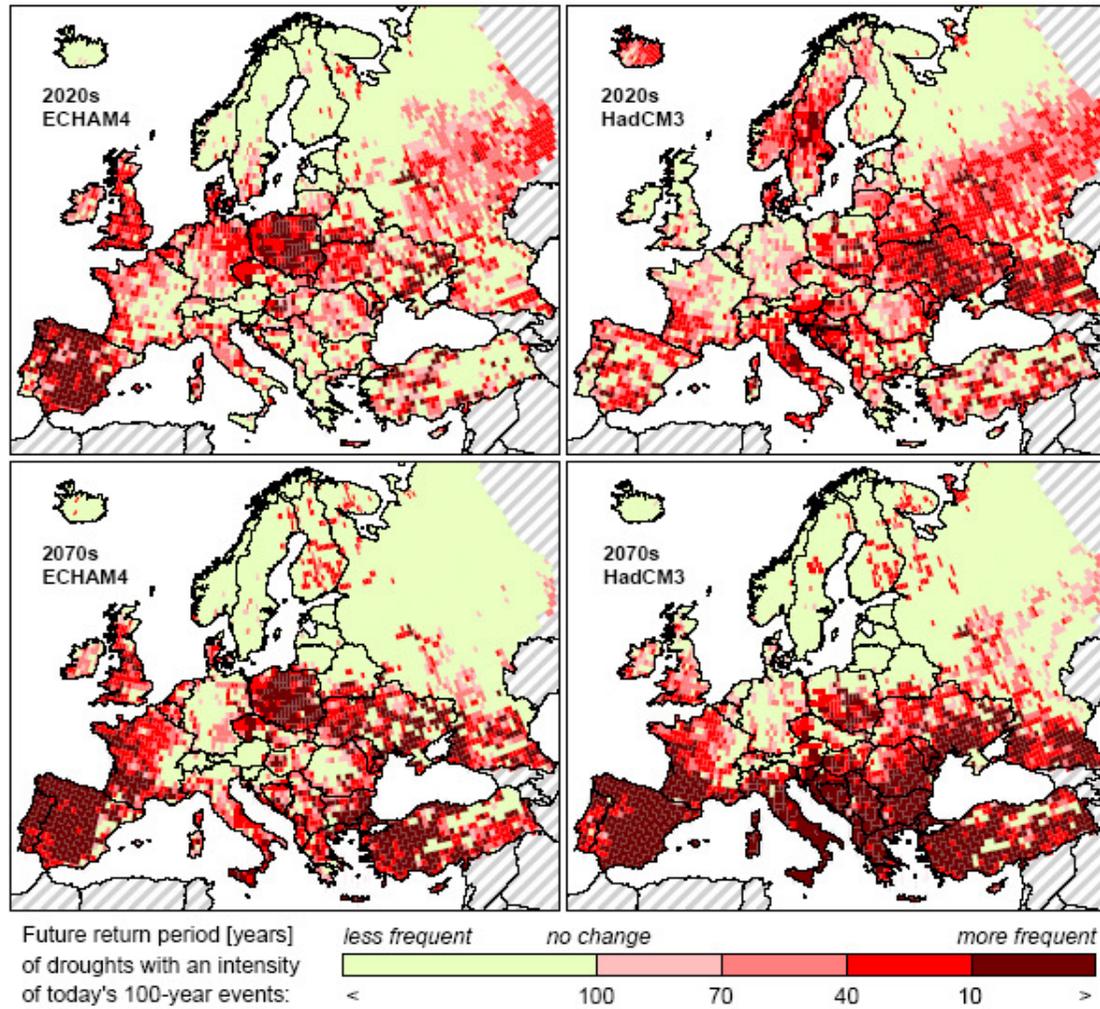
Source: EU Green book on Adaptation, 2007

Annual Runoff change (%) for 2090-2099. Scenario A1B



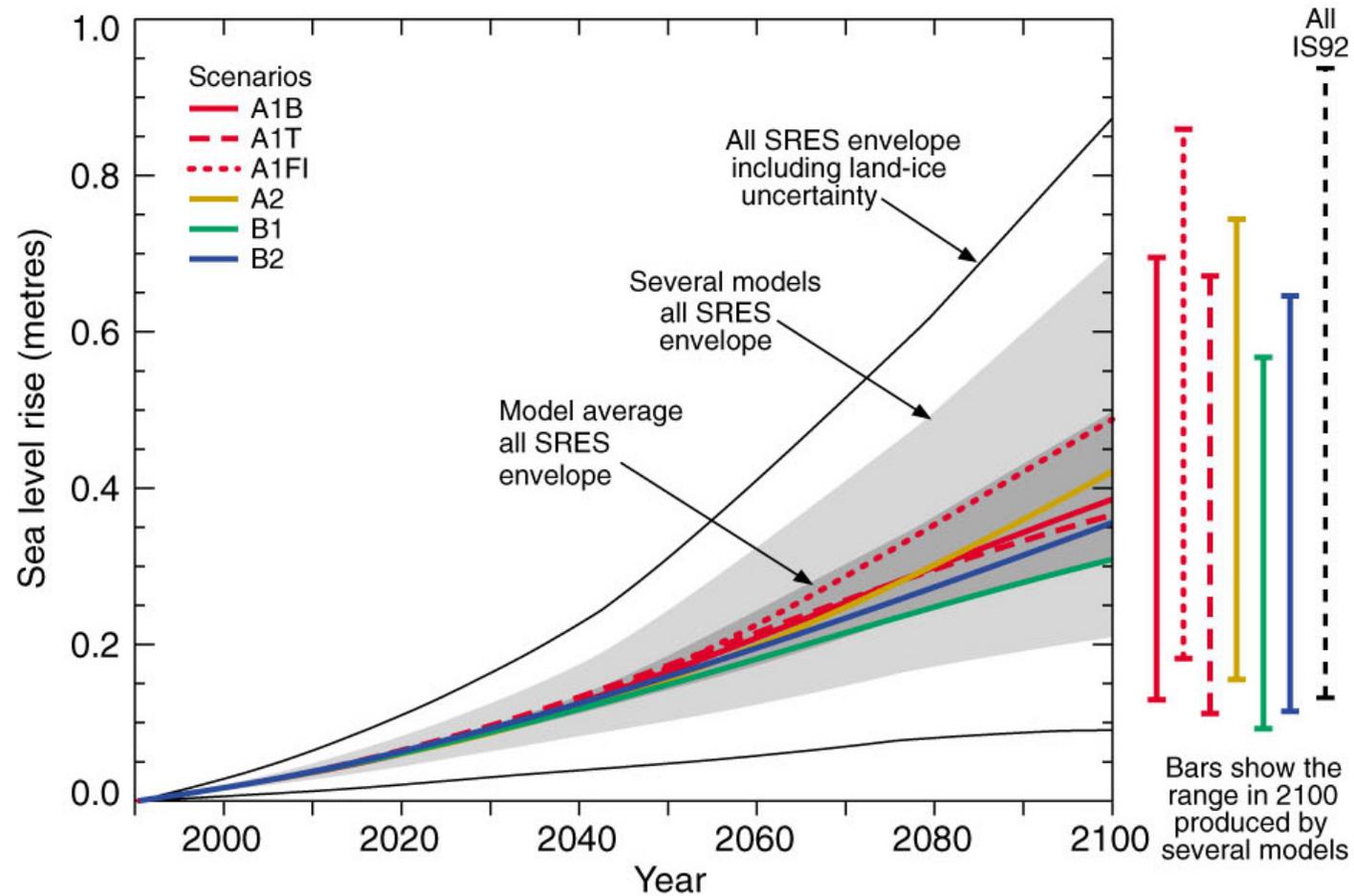
Source: IPCC AR4, 2007

Change in recurrence in 100-yr return period drought



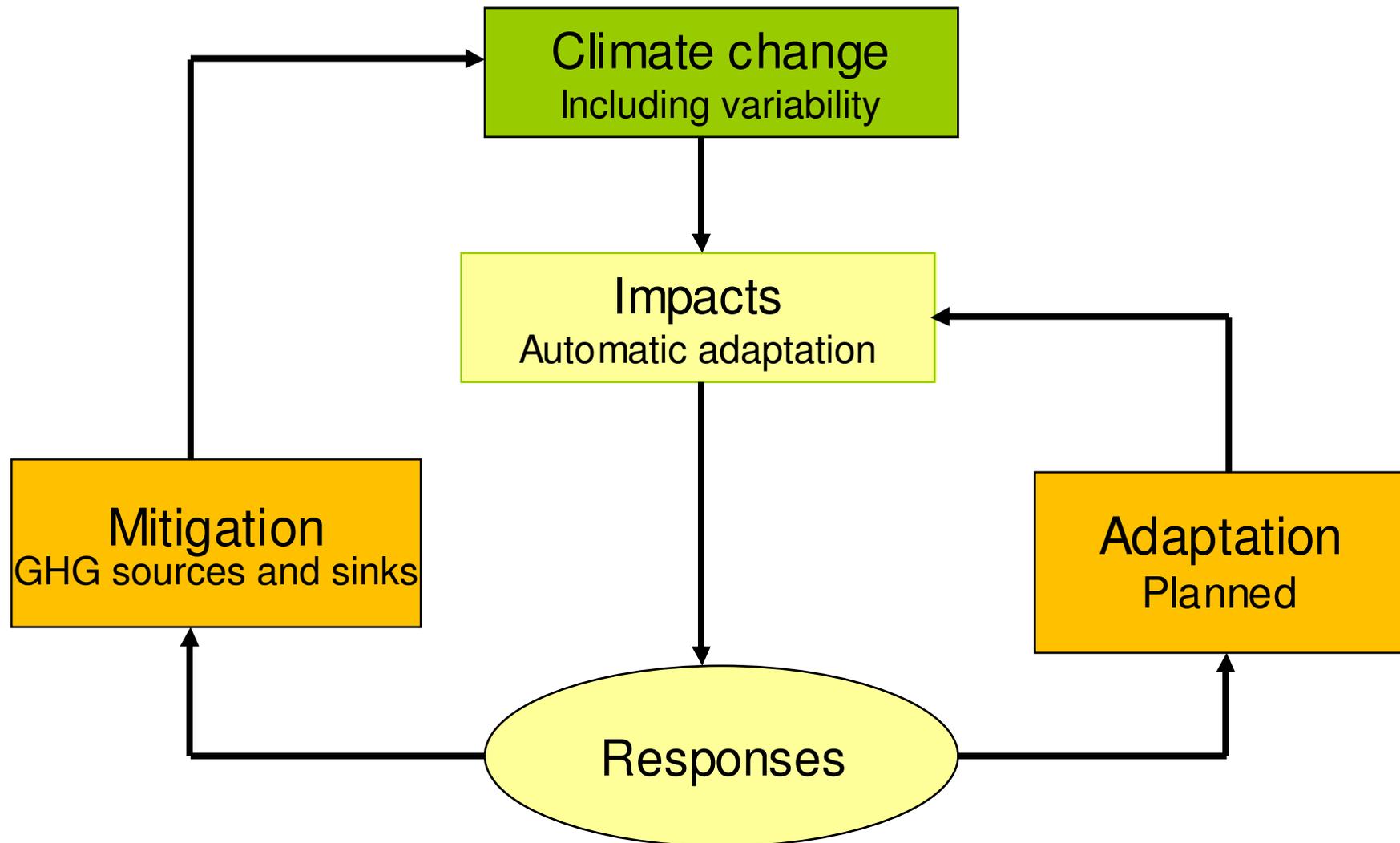
Source: Lehner et al 2005

Sea level rise



Source: IPCC AR4, 2007

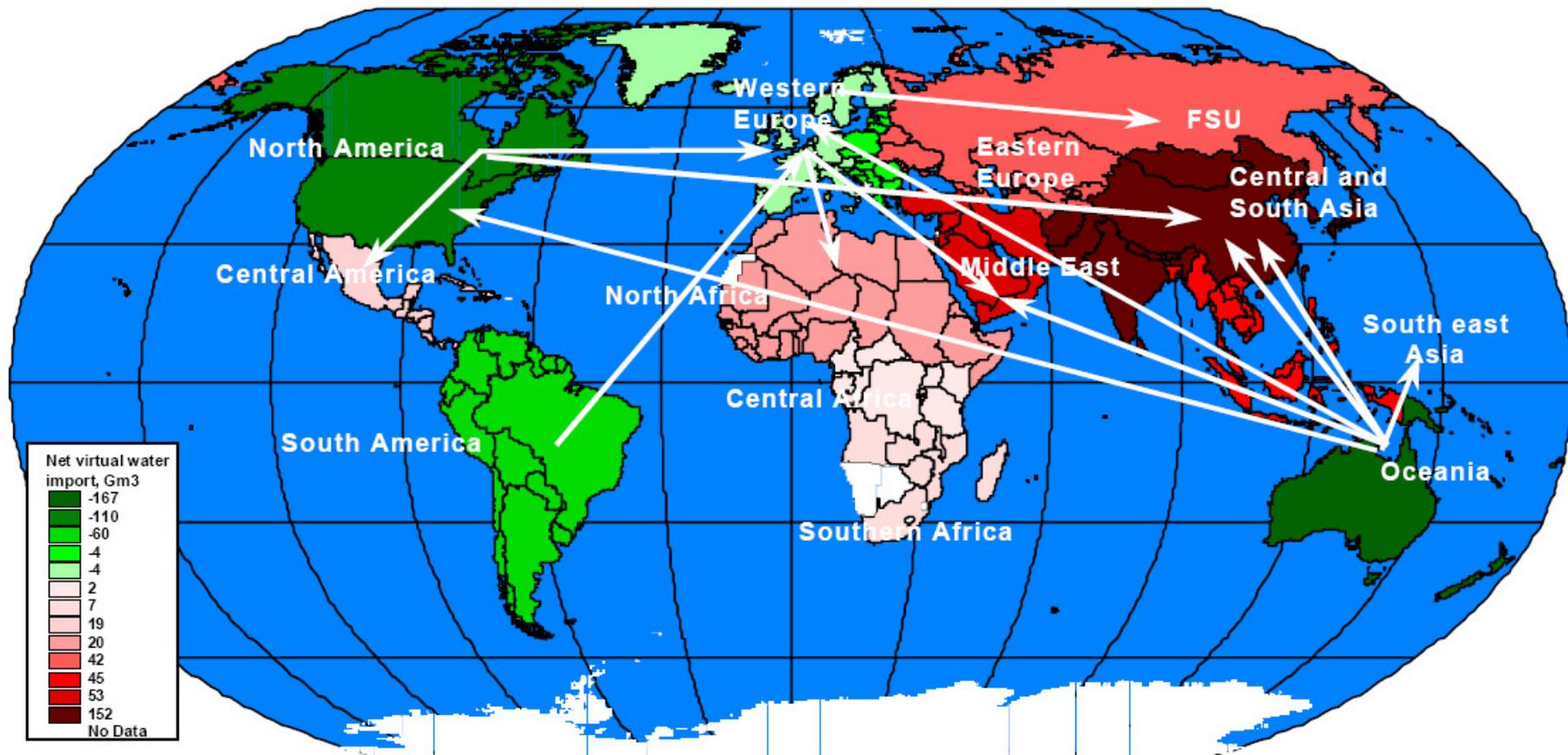
Mitigation vs. Adaptation



Possible reasons in favour of a global water governance

- Local conditions of water scarcity, drought and floods may be modified by global climate change
- Local problems of water pollution may be influenced by the global economy
- Presence of multinationals in the drinking water sector
- Import and export of **virtual water**, particularly in the global trade of water-intensive commodities

International virtual water trade



Source: Hoekstra, 2003

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Increasing water relevance as a geopolitical resource, due to its scarcity and uneven global distribution

The last two centuries

- Industrial revolution
- New development paradigm
- Drivers: industry, trade, transport, urbanization, demographic growth, science & technology
- Resources consumption vs. Renovation capacity of the Earth Ecosystem
- Feedback Mechanisms of Environmental transformation

Climate Change as a Central Issue

- A scientific, epistemological and political revolution is underway
- 1985: Scientists call attention to global warming and kicked off IPCC
- Now (IPCC AR4, 2007):scientists have two certainties
 - global warming is sure
 - global warming is of an anthropogenic origin

Climate Change as a Central Issue (cont.)

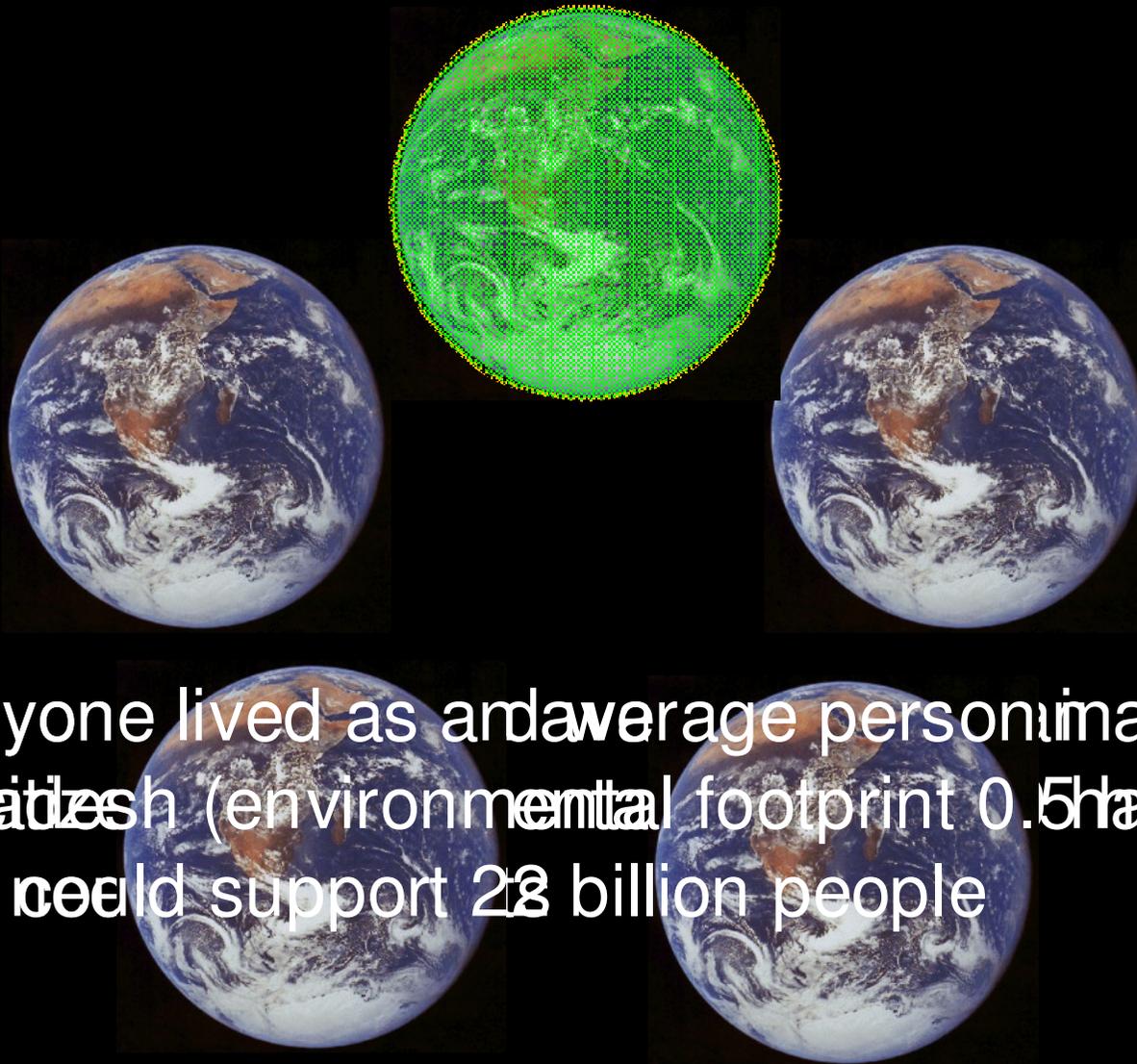
- **Ecological footprint:** Measured in units of biological productive surface, in land and sea, used to produce the resources we use and to receive the waste we produce
- Gigantic geophysical and biologic forces generate the need of choices between confrontation and cooperation
- The special role of water

Adaptation to Climate Change

- Governments and citizens are now aware of climate change, but environmental change is so quick, that it exceeds the capacities of human adaptability to its effects. The Katrina disaster, the permanent destruction of a large western city in 2005, is an example
- This disaster is a symbol of the challenges posed to 21st century societies by climate change

Focus of Climate Change is moving

- A conceptual revolution at global scale
- Cost of extreme climate phenomenon
- Stern Review (2006): the emergence of climate issues in the financial sphere
- Ecology: from a political issue to the core of contemporaneous capitalism
- Impacts: from local, to regional, to global



- If everyone lived as an average person in an average British town (environmental footprint 0.5ha) the planet could support 28 billion people

The Anthropocenic Era

- The immoderate use of hydrocarbons
- The unlimited exploitation of natural resources
- The massification of the urban phenomenon: megapolis and megalopolis
- Cities as drivers of intense environment degradation and of inequalities

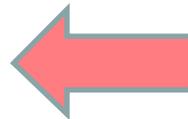
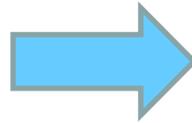
Environment and Energy

- Historical evolution of the forms of energy use: from onset of life in Earth to present times
- Life dependence on hydrocarbons
- Peak oil, peak food and peak water

Water and energy

WATER FOR ENERGY

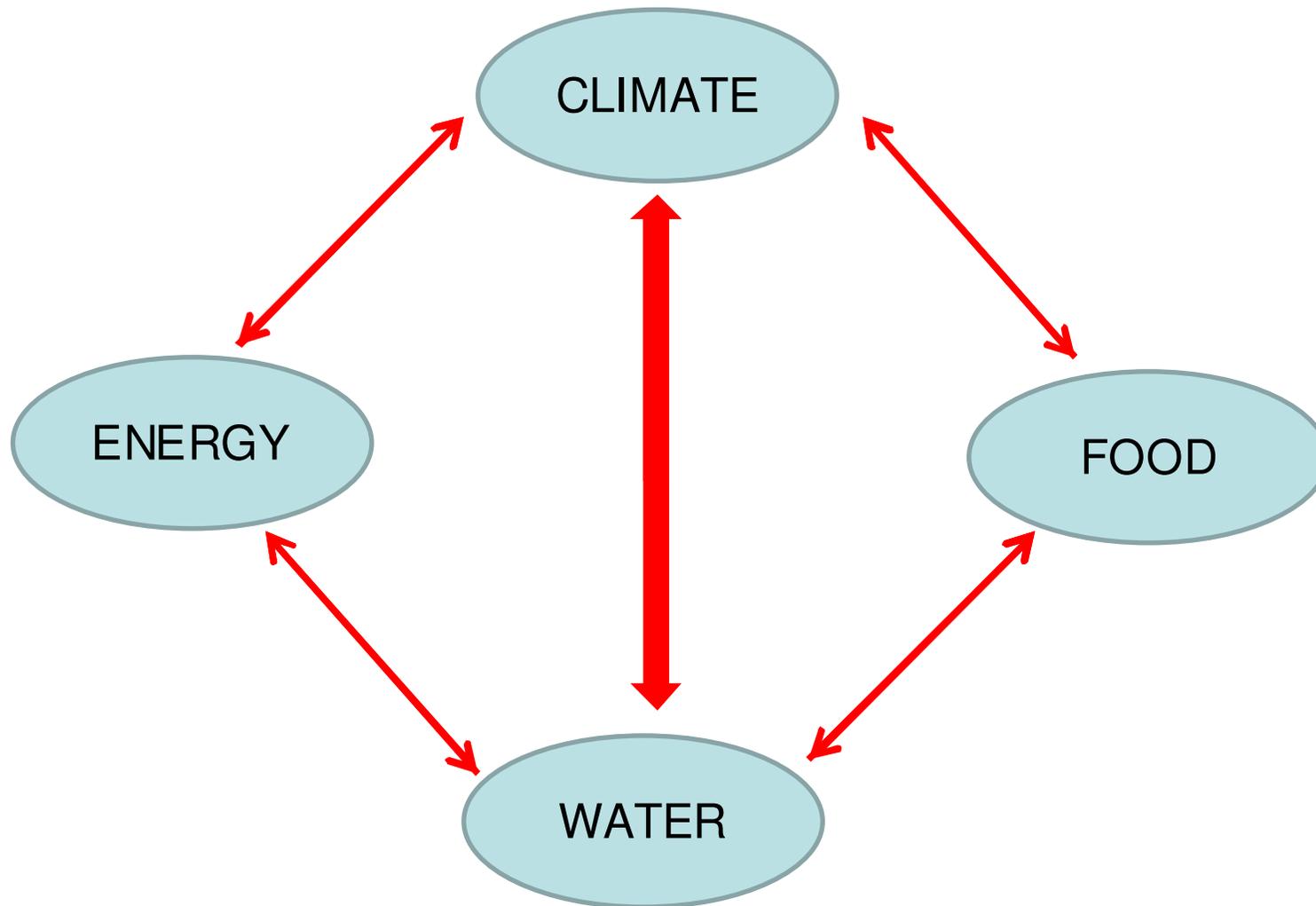
- Thermo-electric cooling
- Hydropower
- Mining and minerals extraction
- Fossil fuel production
- Bio-fuel production



ENERGY FOR WATER

- Pumping
- Transport
- Treatment
- Dessalination
- Transport in containers

Source: Jonch-Clausen, 2007



Managing the future

- 1970 Ecologists: “Think globally, act locally”
- 90’s Globalisation: a kind of mantra explaining all economic and social evolution in a framework of economic liberalism and diffusion of new technologies
- 2000: Around the turn of the millennium globalisation becomes also environmental (the Global Ecosystem).

Globalisation

- Generalization of the euro-american model of rapid growing of energy and natural resources consumption and of injection in the natural cycles of waste. These effects have their own dynamics which deprive human societies of what they absolutely need to perpetuate themselves
- A socio-political global dynamics has to be implemented with the purpose of favouring an evolution of the relationship between man and the Earth global system, which can prevent a global socio-economic collapse

Singularity

- Possible attitudes of politicians:
 - expectation (doing nothing)
 - take action (try to solve the problems).
- But the solution will be suffered by humans
- The potential collective suffering will be beyond our capacity of perception. It will correspond to what some call a **singularity**

Singularity

- The concept of singularity, inherited from the black holes in astrophysics, aims to describe an unknown phenomenon which is indescribable before it actually happens
- A singularity can be defined as the existence of a range of perception beyond which our imagination stops, our models lose validity and there is a new reality replacing the previous one

Is there a way out?

- Globalization may perhaps be economic, but, for sure, it should also be environmental, aimed to limit seriously the degradation of the life tissue of which man is not a free user but rather a part of it
- Our close future has to be one where human **creativity, politics, science and technology, culture and ethics** assume a global project of perpetuation of our societies through the preservation of natural environment
- **Recent events seem to indicate that we should take further care of these matters**

Thank you for listening