A recognised success for the 6th World Water Forum which gathered more than 35,000 participants in Marseille

400 open sessions of which fifty major ones.

Participations (key figures)

- ☐ 15 heads of State, of governments and European Commissioners
- ☐ 173 represented countries
- ☐ 103 Ministers, Vice-Ministers and Secretaries of State
- ☐ 170 national delegations and international organisations taking part in the Ministerial Declaration
- ☐ More than 750 elected officials among which 250 mayors and 250 parliamentarians
- ☐ More than 500 sponsorised persons
- ☐ 3,500 NGOs and civil society representatives

6th WORLD WATER FORUM
MARSEILLE, FRANCE '12
TIME FOR SOLUTIONS

More than

1600 solutions

proposed

Jean-luc Redaud
Académie de l'eau

Final ministerial declaration

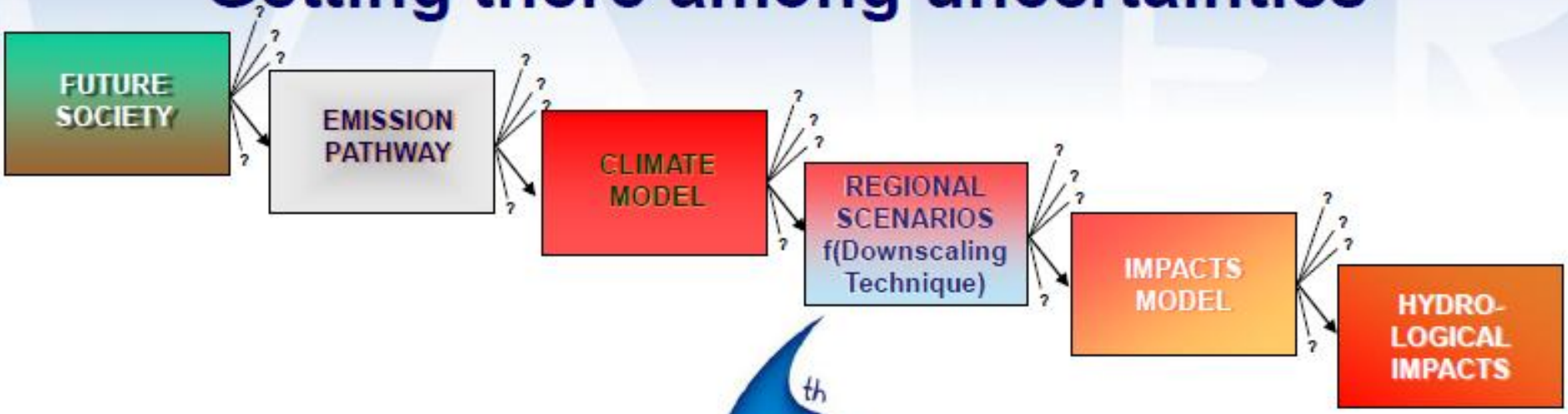
Ensure Everyone's Well-Being: Accelerate Access to Safe Drinking Water and Sanitation, Expand Sanitation and Deliver on Water and Health

Contribute to Economic Development: Green Economy, Water for Food Security and Water and Energy

Keep the Planet Blue: Water in the Rio Conventions, Water-Related Disasters and Water and Urban Development

GLOBAL CHANGE AND WATER RESOURCES

Getting there among uncertainties



th WORLD WATER FORUM
MARSEILLE, FRANCE '12

TIME FOR SOLUTIONS

United Nations Educational, Scientific and Cultural Organization

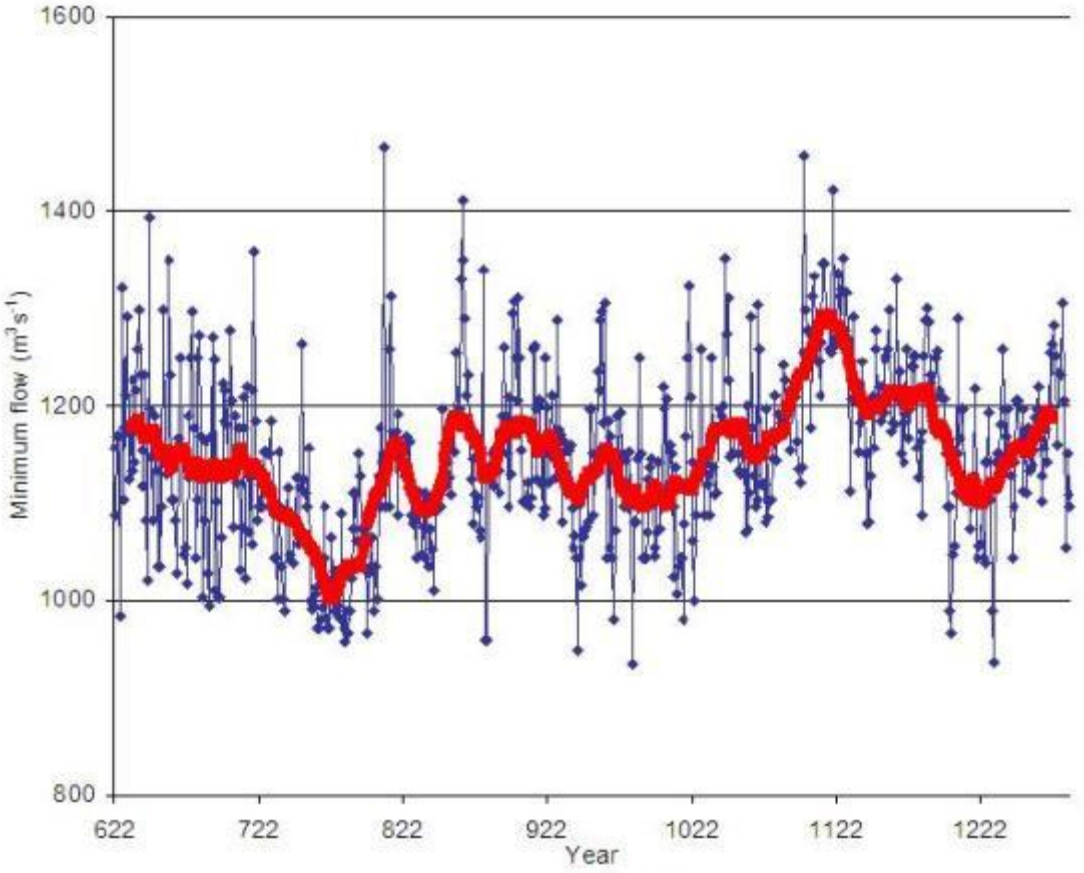
International Hydrological Programme

By Schulze, 2008

Académie de l'Eau

What do we mean by "Climate Change"?

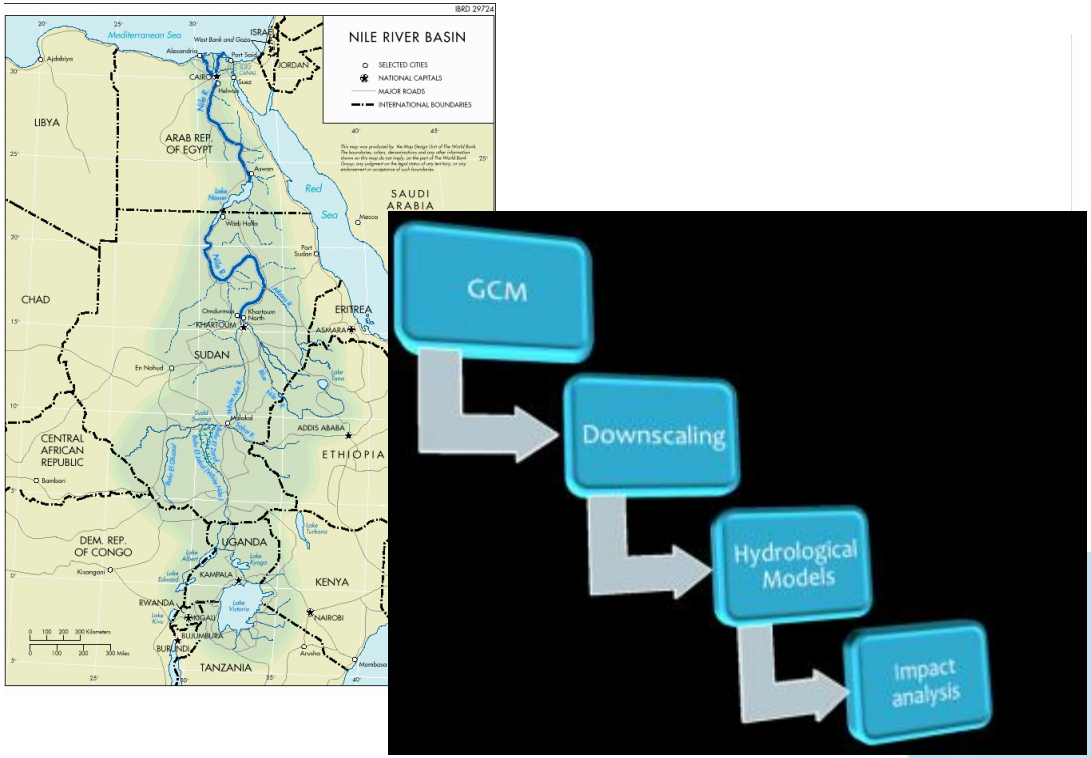
- *Annual minimum flow of the River Nile (622-1284) at Roda, near Cairo*
  - Natural Climate Variability
  - Hurst/Persistence/Memory

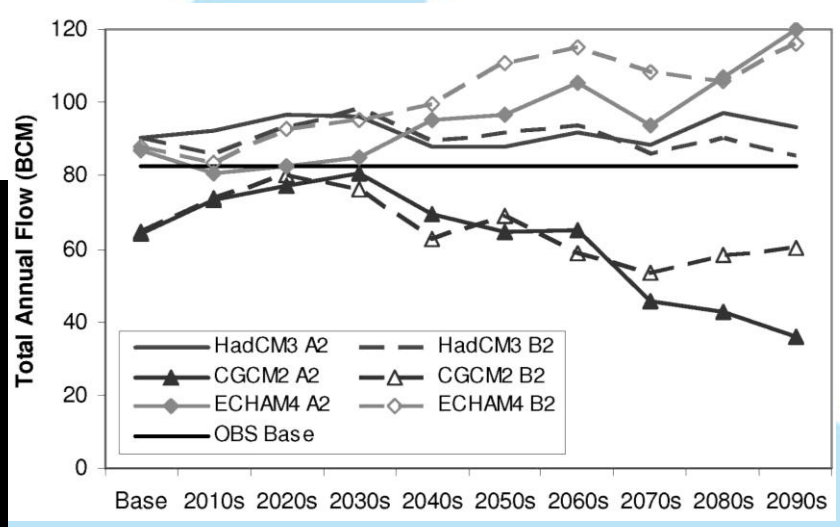


(Elshamy et al., Hydrology and Earth System Sciences, 2009)

Climate Change Impact

- **Uncertainty**
  - Simulated decadal mean flows of the River Nile at Dongola up to 2090s
  - Entire modelling chain is affected by Significant Uncertainty

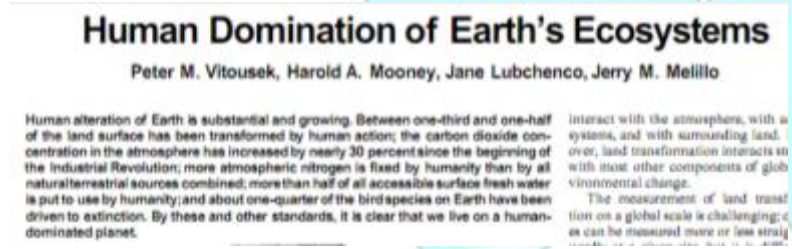




(Di Baldassarre et al., IAHS Hydrological Sciences Journal, 2011)

Climate Change Only?

- *Natural, undisturbed, pristine catchments are more and more uncommon*



Human Domination of Earth's Ecosystems

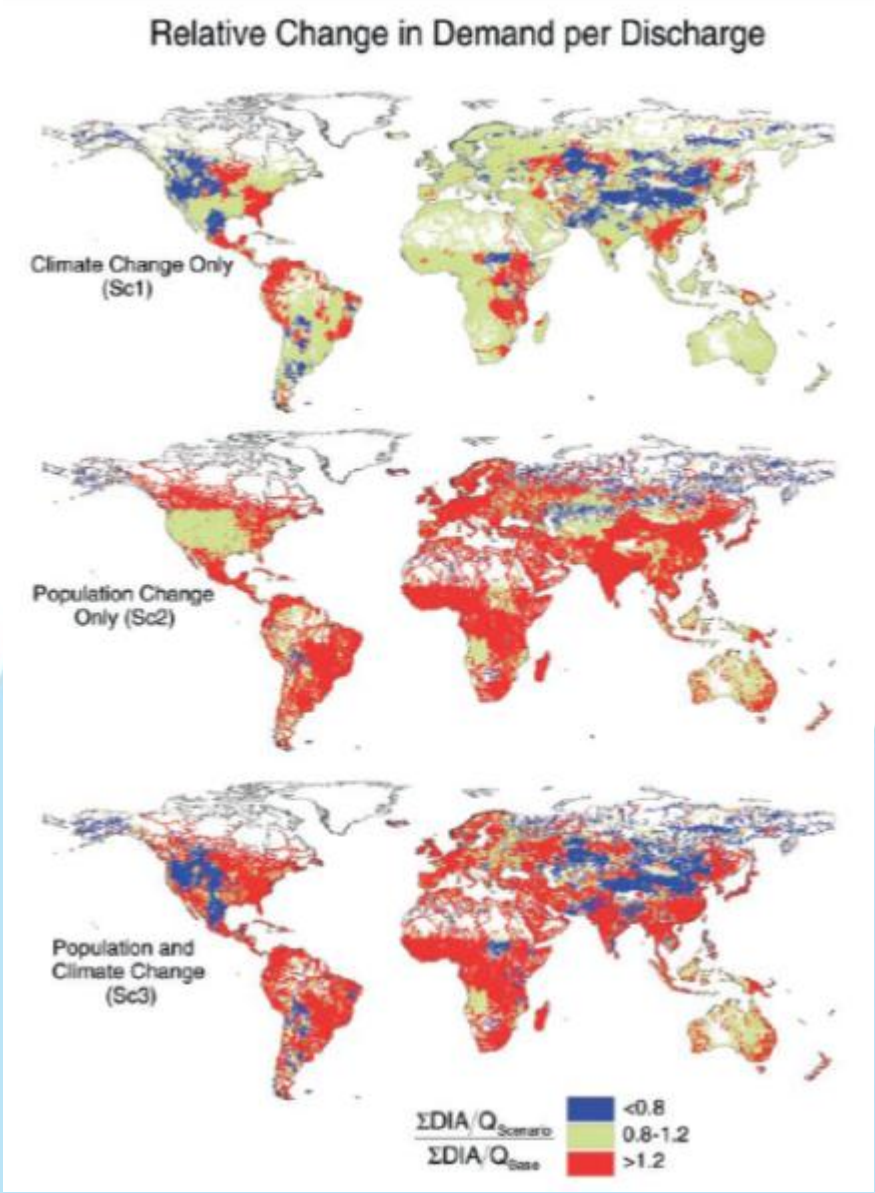
Peter M. Vitousek, Harold A. Mooney, Jane Lubchenco, Jerry M. Melillo

Human alteration of Earth is substantial and growing. Between one-third and one-half of the land surface has been transformed by human action; the carbon dioxide concentration in the atmosphere has increased by nearly 30 percent since the beginning of the Industrial Revolution; more atmospheric nitrogen is fixed by humanity than by all natural terrestrial sources combined; more than half of all accessible surface fresh water is put to use by humanity; and about one-quarter of the bird species on Earth have been driven to extinction. By these and other standards, it is clear that we live on a human-dominated planet.

(Sanderson et al., BioScience, 2002)

Population change

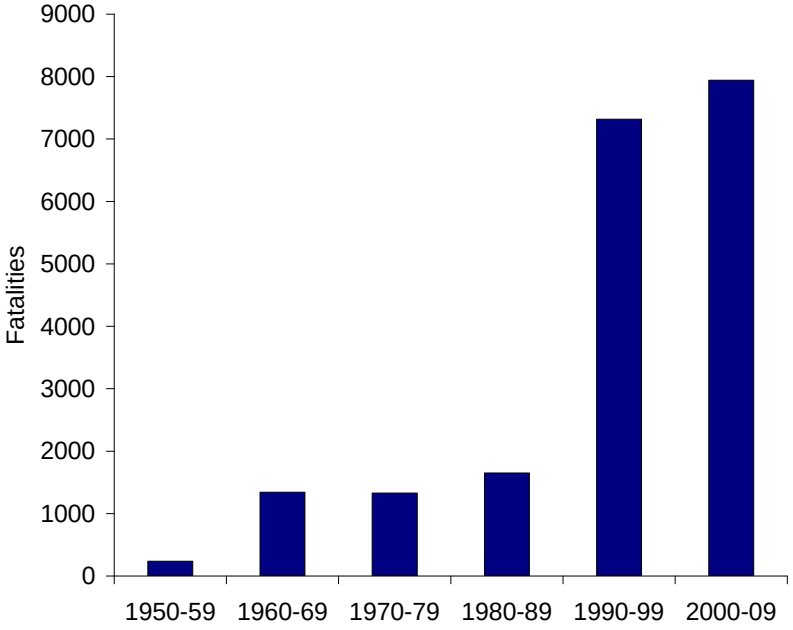
- **Population growth**
  - Land use change, Economic development, etc..
  - Spatial and temporal dynamics (urbanization)
  - Often outweighs climate change

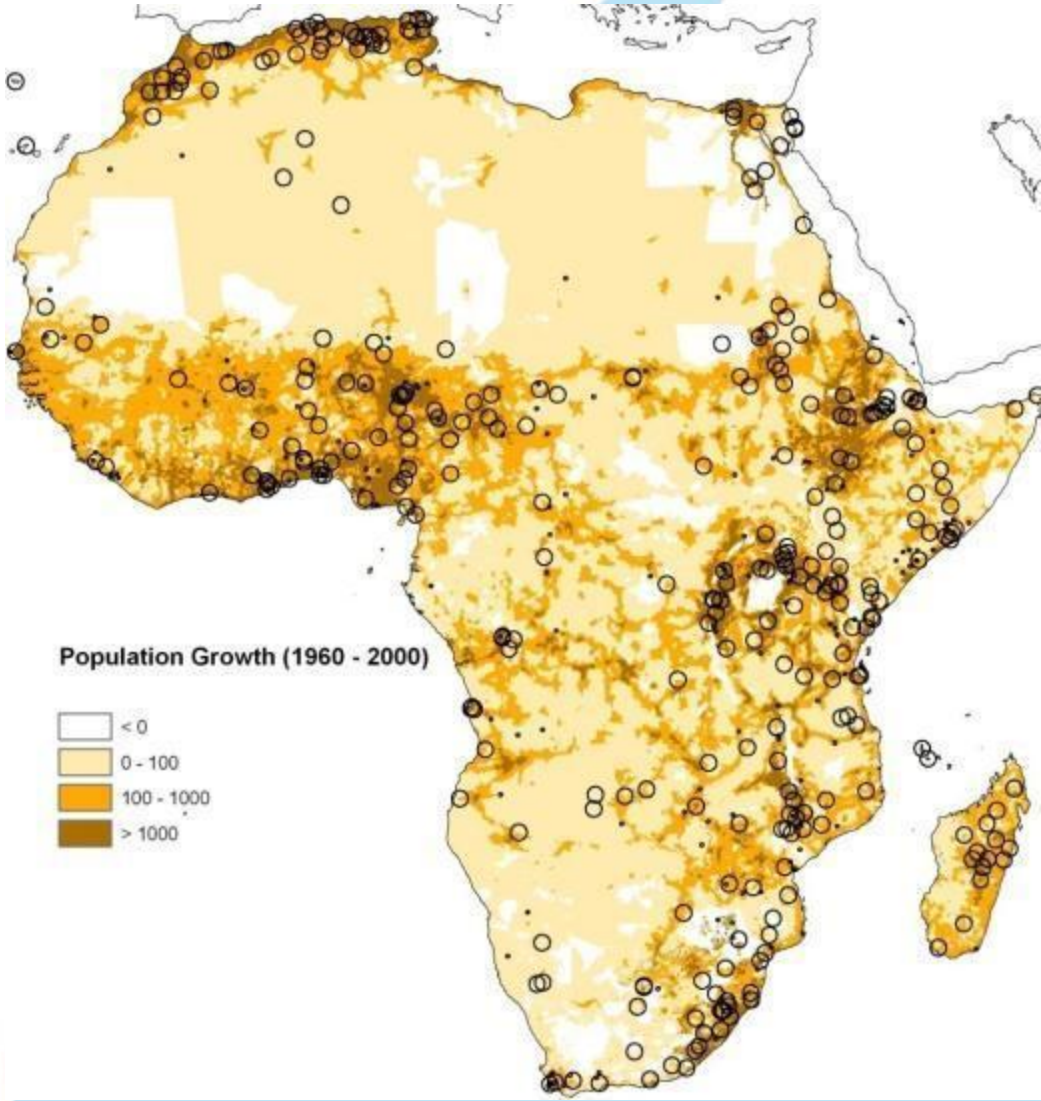


(Vorosmarty et al., Science, 2000; Alcamo et al., HSJ, 2007; Carter & Parker, HSJ, 2009)

Population change

- *African Floods and Population Dynamics*

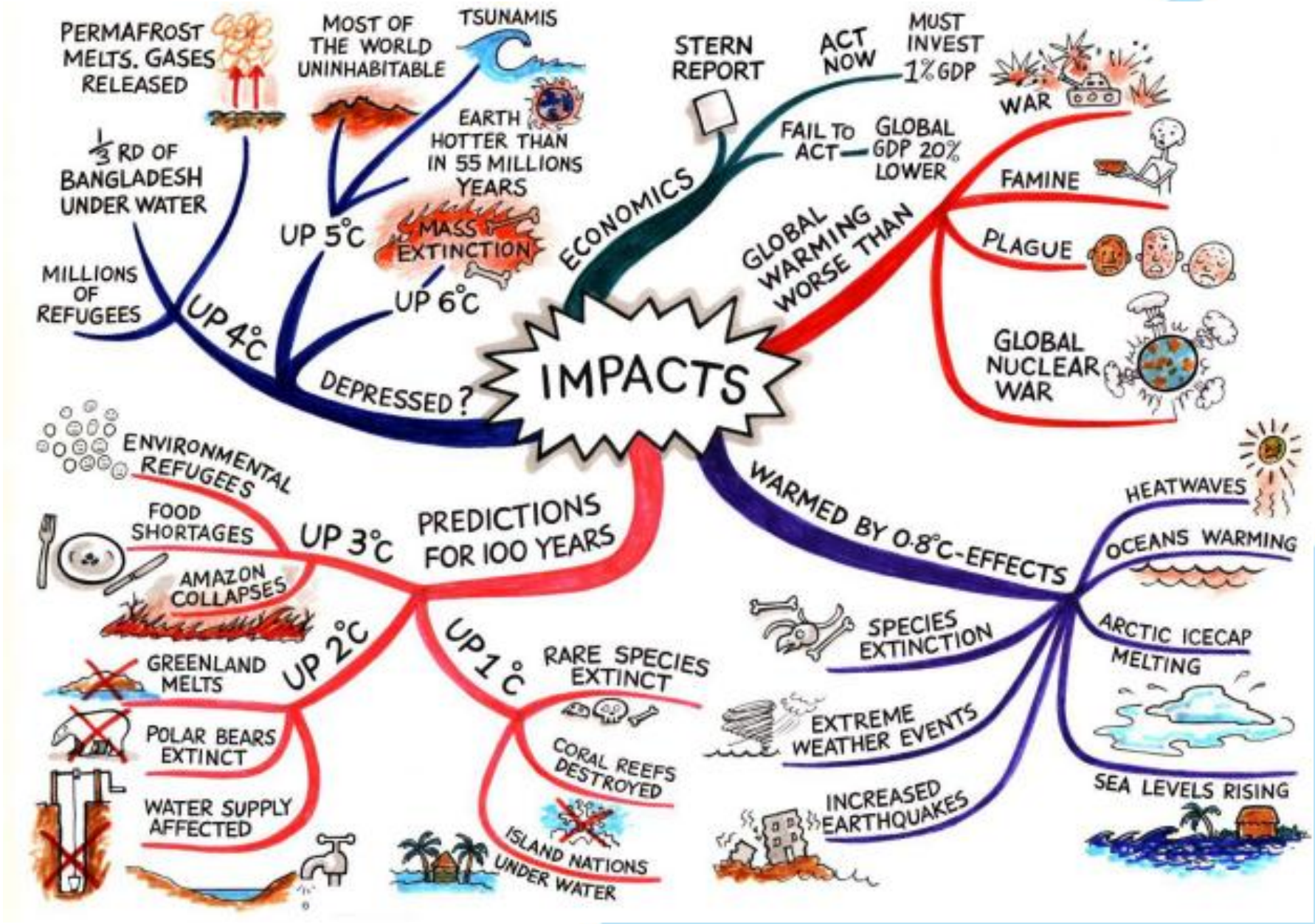




(Di Baldassarre et al., Geophysical Research Letters, 2010)

PM

Many possible direct and indirect impacts



(Rob Swart, CIRCLE-2, 2010)

Which uncertainties should be considered?

Apart from those described by the IPCC exercise:

- ***Uncertainties on climate itself***
  - ***Through natural aggravation***
    - Antarctic and Groënland ice cap melting/flowing, methane emissions by permafrost melting and ocean
    - Natural and anthropic retroactions on climate (land use retroaction, wars, epidemics, desertification, land grabbing, etc.)
  - ***Through anthropic aggravation***
    - Adaptation of human activity, Massive deforestation, GHG emissions
- ***Possible strong effects, and unquantifiable uncertainty***
  - Thermohaline ocean circulation shut-down
  - Amazonian forest instability
- ***Climate surprises***
  - Volcanic eruptions, tsunamis, increased tornadoes,
- ***Unknown ?***

Coping with Uncertainty

- *Natural Climate Variability*
- *Uncertainty in Climate Projections*
- *Economically- and Demographically-driven changes often outweigh Climate Change*
- *Water Management –How to deal with Global Change?*
  - Recognize Uncertainty (sources, estimation, communication)
  - Avoid heavy reliance on climate projections ("all models are wrong")
  - Scientists consulted for plausability checks
  - Build adaptive capacity ("no-regret")
  - Build-up resiliency (capacity to recover from stress)
  - Robustness of alternative options to a range of plausible futures
  - Through multi-stake-holder involvement (imagination, acceptation, effectiveness, success)

(Dessai et al., 2009; Goulden et al., 2010; Di Baldassarre et al., 2011)

4 key recommendations.

1 ***By 2013:*** compile a **scientific review and synthesis** on the impacts of climate change on groundwater resources including management recommendations and bring it to the attention of IPCC authors as a contribution to the on-going preparation of the 5th Assessment Report.

2 ***By 2012:*** initiate a **networking platform for researchers and water managers** as a water science-policy interface in order to facilitate communications in relation with the IPCC and other UN conventions, and to provide relevant inputs to help water resources managers develop effective management and climate change adaptation strategies.

3 ***By 2012:*** provide a **networking platform of basin organizations** for the collection and exchange of best practices and experiences on the implementation of climate change adaptation strategies in the field of water resources planning and management, relying on existing initiatives of UNECE and INBO and involving regional and international programmes.

4 ***By 2015:*** develop **methodological guidelines** based on gathered information and lessons learned from both networks, to promote the creation of new tools of governance for decision-makers to better integrate climate change impacts into water resources planning and management.

Croissance verte ?

Economie verte ?

Economie de transition ?

Water and green growth

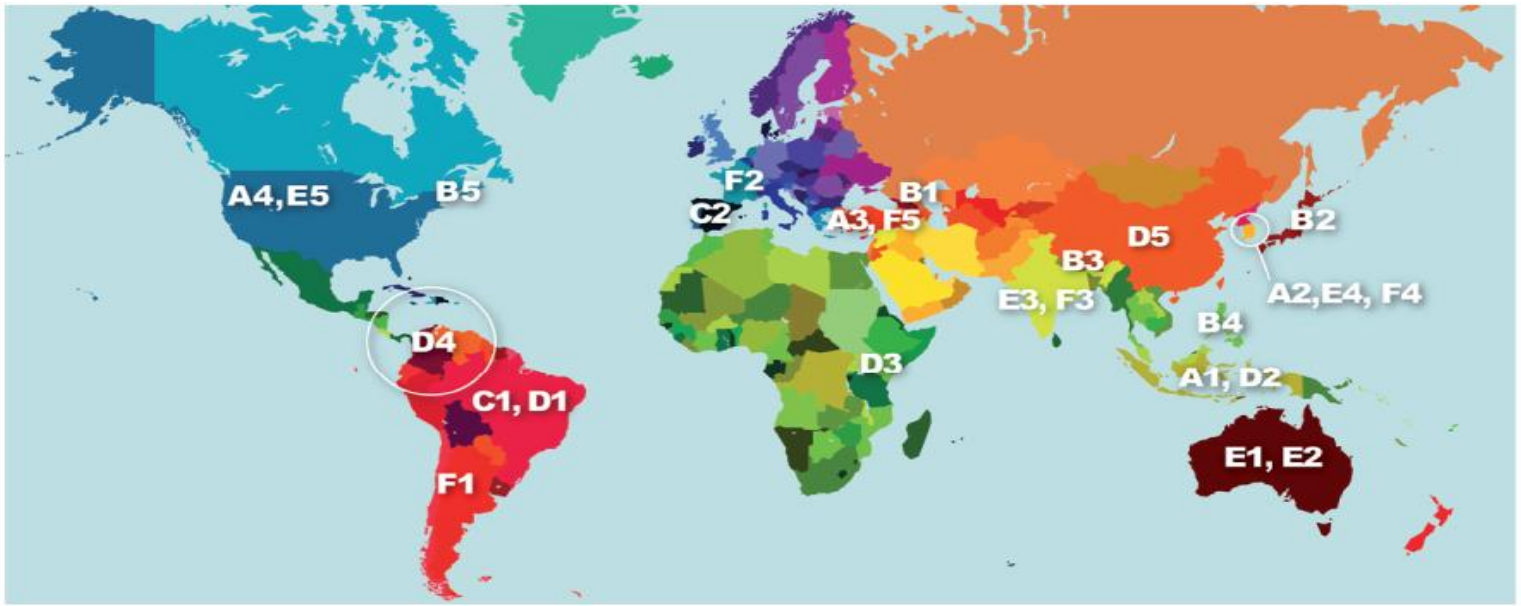
Box 1: Definitions related to green growth, green economy and water and green growth:

The Water and Green Growth project defines green growth as: a strategy that fosters economic growth and development, protects natural ecosystems and the resources and environmental services they provide, and enhances socially-inclusive development.

Building upon this, water and green growth is defined as: a strategy to invest in water infrastructure and water security, fostering economic growth and development, protecting the environment and the services it provides, and enhancing socially-inclusive development.

Green growth : Strategies and goals of republic of Korea

Mitigation of climate change and energy independence	1. Effective mitigation of greenhouse gas emissions 2. Reduction in the use of fossil fuels and the enhancement of energy independence 3. Strengthening the capacity to adapt to climate change
2. Creation of new growth engine	4. Development of green technologies 5. Greening of existing industries and promotion of green industries 6. Advancement of industrial structure 7. Engineering a structural basis for the green economy
3. Improvement in quality of life and enhanced international standing	8. Greening the land, water and building the green transportation infrastructure 9. Bringing green revolution into our daily lives 10. Becoming a role-model for the international community as a green growth leader



A Ecosystem Recovery & Water Quality Improvement

A1 Green Growth-Based Integrated Water Management
Indonesia (Citarum River Basin)

A2 Development of Lake District
Republic of Korea (Lake Sihwa)

A3 Rehabilitation of Urban Estuary as a Green Growth Project
Turkey (Golden Horn, Istanbul)

A4 Water Quality Management & Wastewater Services
USA (Tualatin River Watershed, Oregon)

B Watershed Management

B1 Integrated Natural Resources Management in Watersheds (INRMW) Programme
Georgia

B2 Regional Development & Canal Project
Japan (Aichi Canal)

B3 Rural Electrification Project (AHREP)
Nepal (Andhikhola River)

B4 River System Rehabilitation
The Philippines (Las Piñas-Zapote River)

B5 Basin-Scale Approach to Balancing Power Generation & Ecosystem Restoration
USA (Penobscot River, Maine)

C Policy, Planning & Governance

C1 Green Growth & Integrated Water Resources Management
Brazil

C2 Water Planning Towards a Green Economy
Spain (Ebro River Basin)

D Financing & Public-Private Partnerships

D1 Public Policy of Payment for Environmental Services: A Financial Instrument to Improve Water Quality
Brazil

D2 Rewards for Watershed Services
Indonesia (Sumberjaya Watershed)

D3 Payment for Environmental Services Pilot Project
Kenya (Lake Naivasha Basin)

D4 Public-Private Fund Mechanism for Watershed Protection: Water Funds
Latin America & the Caribbean (Columbia & Ecuador)

D5 Eco-Compensation for Watershed Services
People's Republic of China

E Innovation & Technology

E1 Integrated Urban Water Management: Modelling Human Behaviour
Australia

E2 Recycled Water Scheme: A Best Practice for Industrial & Potable Supply Augmentation
Australia (Western Corridor)

E3 Role of Technology in Water Quality Improvements
India (Gujarat State)

E4 Photovoltaic System Floating on Reservoir
Republic of Korea (Hapcheon Dam)

E5 Nutrient Recovery and Conversion to Fertilizer
USA (Tigard, Oregon)

F Infrastructure

F1 Sanitation Plan
Chile (Santiago Water Basin)

F2 Logistical Hotel: A River Transport Project
France (Quai d'Austerlitz, Paris)

F3 Urban Water Sector Improvement Project
India (Karnataka State)

F4 Four Major Rivers Restoration Project
Republic of Korea (Han, Nakdong, Geum & Yeongsan Rivers)

F5 Participatory Irrigation Management
Turkey

Increasing resilience to climate change

Climate change increase risks due to drought and floods

Large investments in water have reduced insecurity due to water in developed countries and recently in china, brasil, india

Large investments may be not flexible (dams)

Food,energy and water security are connected but may have adverse effects

Democratic solution adapted to local context have to be privilegied

Numerous sessions on climate change for identifying Factors for success

Cross-cutting factors

Environmental factors

Social factors

Economic Factors

1. Collaboration among a wide variety of interests, public and private interests & partnerships;
2. Economic opportunities for industry, small-scale enterprises, commerce and agriculture;
3. Demand management and improved effi ciency as means to water and energy savings;
4. Better utilization of existing waterways, revitalization of urban waterfronts, mixed-use waterfront

development;

5. Large-scale infrastructure balanced with small-scale innovations;
6. Increased water availability from recycling and pollution control & wastewater treatment;
7. Costs and benefi ts shared by upstream stewards and downstream benefi ciaries;
8. Financing from multiple sources, including public and private investors.

Key new messages

water- food-energy nexus

Coping with climate change and global changes

Water and green growth

TIME FOR SOLUTIONS

pour les ONGs Rio+20
Une transition fondée sur 4 régulations

1. *Régulation économique et financière*
2. *Socle international de protection sociale et arêt dumping social*
3. *Régulation écologique, changement climatique, dumping social*
4. *Régulation juridique fondée sur adoption charte des responsabilités universelles*

TIME FOR SOLUTIONS

MARSEILLE - FRANCE

TIME FOR SOLUTIONS

MERCI / THANK YOU

worldwaterforum6.org

solutionsforwater.org

Jean-luc.redaud@m4x.org

Academie de l'eau