

Key water issues in Africa: need to strengthen water Security in Africa

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Water Security

“The capacity of a population to safeguard sustainable access to adequate quantities of and acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.”

Outline

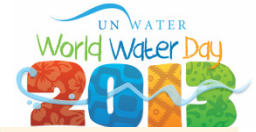
- **Why water security is crucial for Africa?**
- **Why and How IWRM could contribute to achieve Water Security in Africa?**
- **Way forward on Africa Water Cycle Initiative**

Why water security is crucial for Africa?

Water a vital resource for Africa

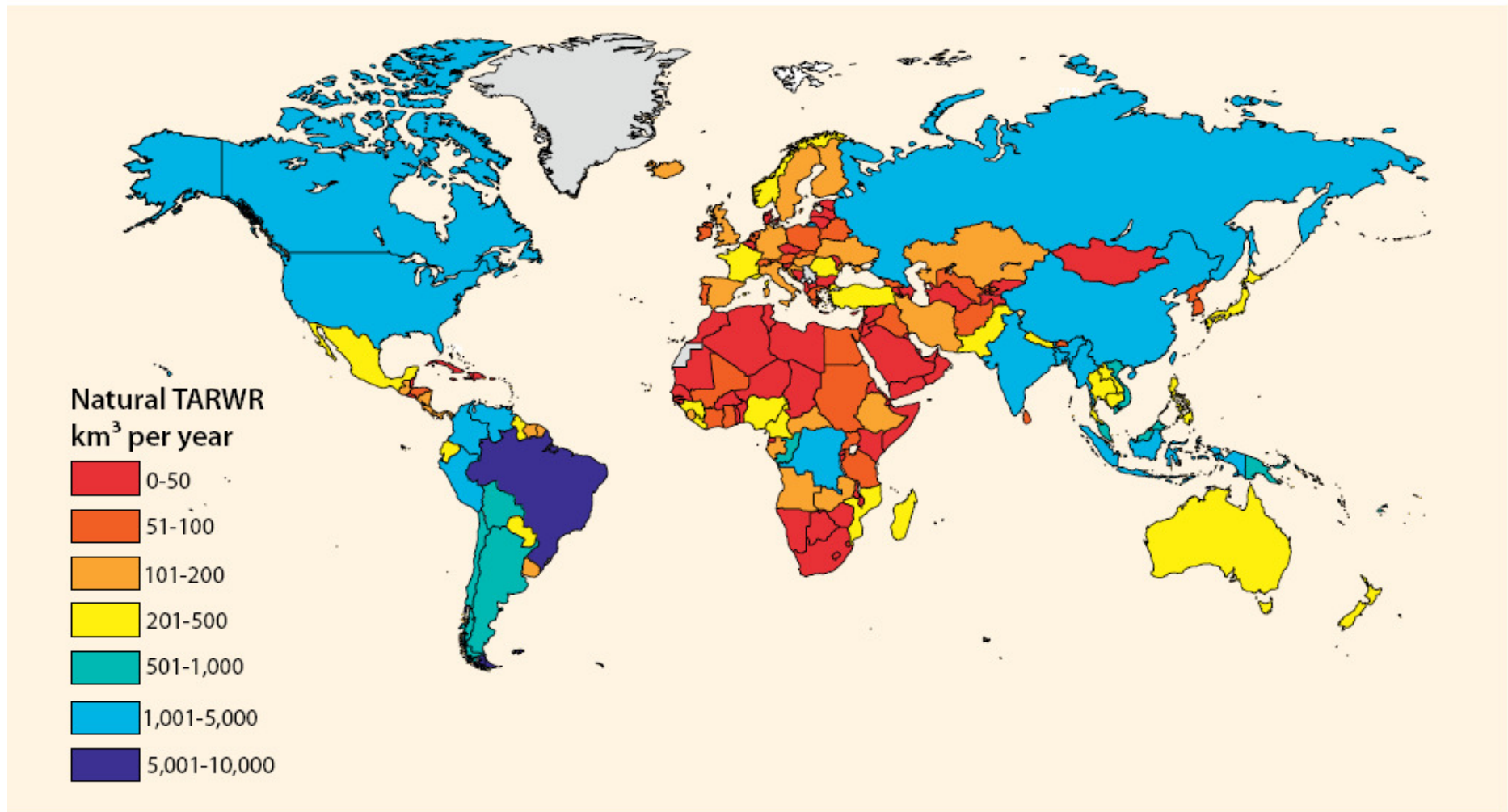
“water is and must remain a key to sustainable development in Africa, and that water supply and sanitation are prerequisites for Africa’s human capital development”.

Sharm El-Shiekh Declaration, 11th African Union Summit (2008)



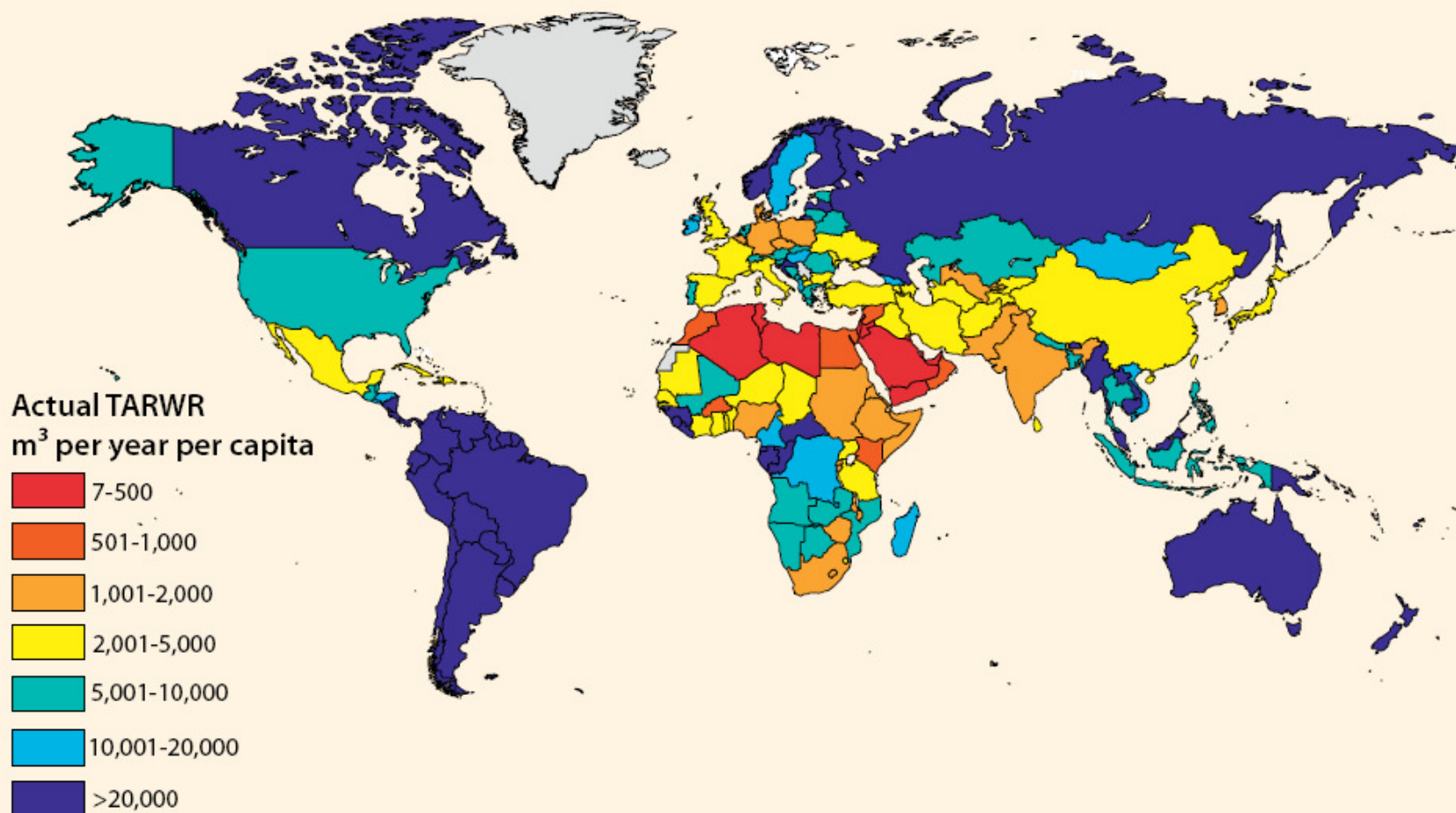
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Total annual renewable water resources (TARWR) by country - most recent estimates (1985-2010)



Source: FAO AQUASTAT database (<http://www.fao.org/nr/aquastat>, accessed in 2011).

Per capita total annual renewable water resources (TARWR) by country - population data from 2009



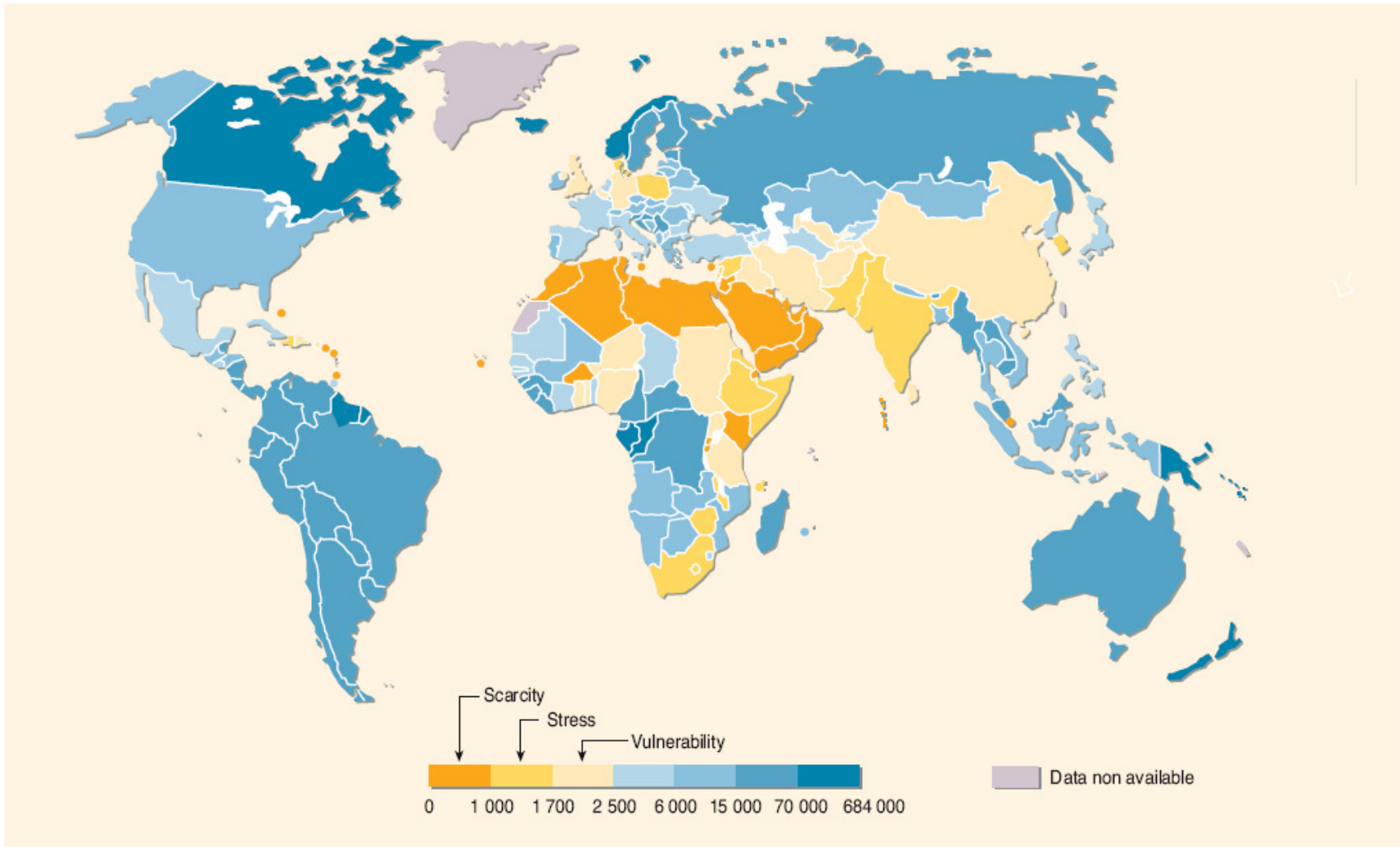
Source: FAO AQUASTAT database (<http://www.fao.org/nr/aquastat>, accessed in 2011).



Freshwater availability (m³ per person per year, 2007)

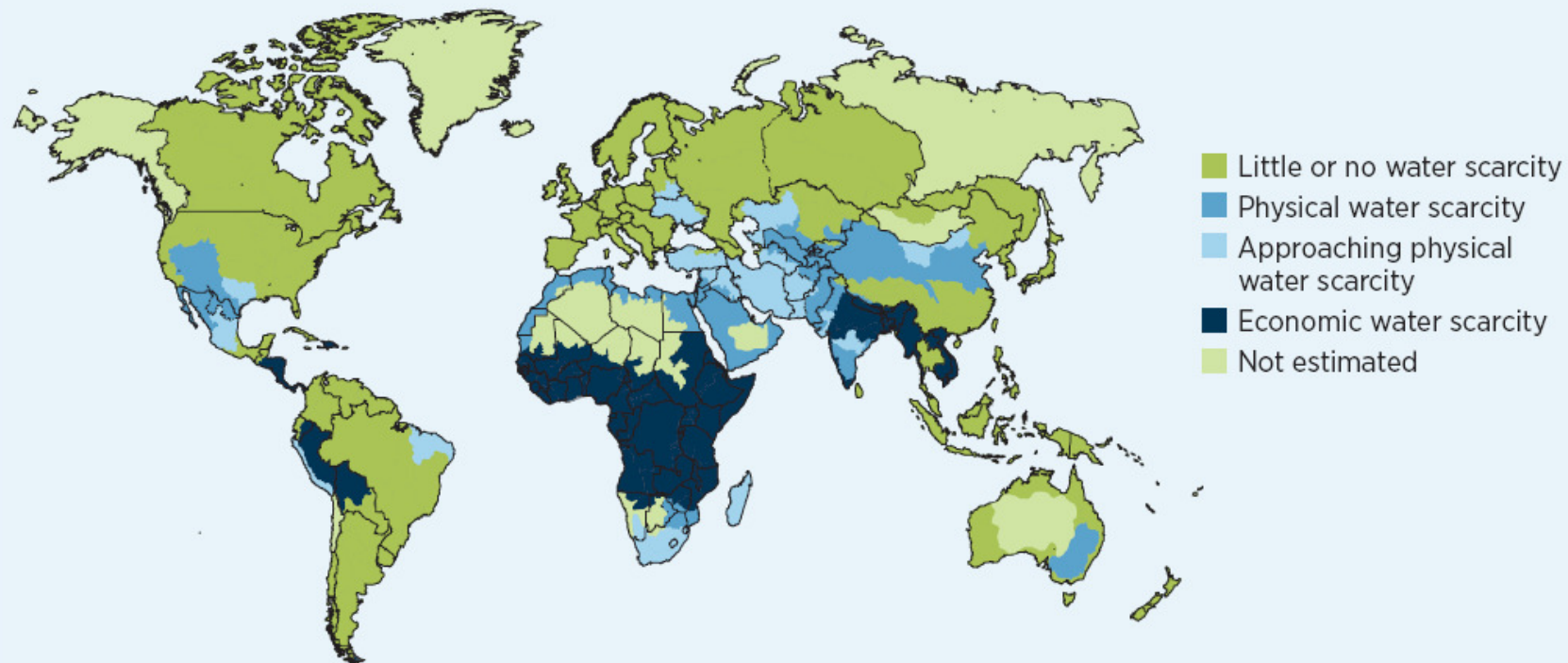


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Source: UNEP/GRID-Arendal (2008) (<http://maps.grida.no/go/graphic/global-waterstress-and-scarcity>, P. Rekacewicz [cartographer] (Le Monde diplomatique), with sources FAO and WRI).

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Definitions and indicators

- Little or no water scarcity. Abundant water resources relative to use, with less than 25% of water from rivers withdrawn for human purposes.
- Physical water scarcity (water resources development is approaching or has exceeded sustainable limits). More than 75% of river flows are withdrawn for agriculture, industry, and domestic purposes (accounting for recycling of return flows). This definition – relating water availability to water demand – implies that dry areas are not necessarily water scarce.
- Approaching physical water scarcity. More than 60% of river flows are withdrawn. These basins will experience physical water scarcity in the near future.
- Economic water scarcity (human, institutional, and financial capital limit access to water even though water in nature is available locally to meet human demands). Water resources are abundant relative to water use, with less than 25% of water from rivers withdrawn for human purposes, but malnutrition exists.

Source: *Comprehensive Assessment of Water Management in Agriculture* (2007, map 2.1, p. 63, © IWMI, <http://www.iwmi.cgiar.org/>) (from an International Water Management Institute analysis using the Watersim model).



NINE WATER CHALLENGES

Access to safe drinking water

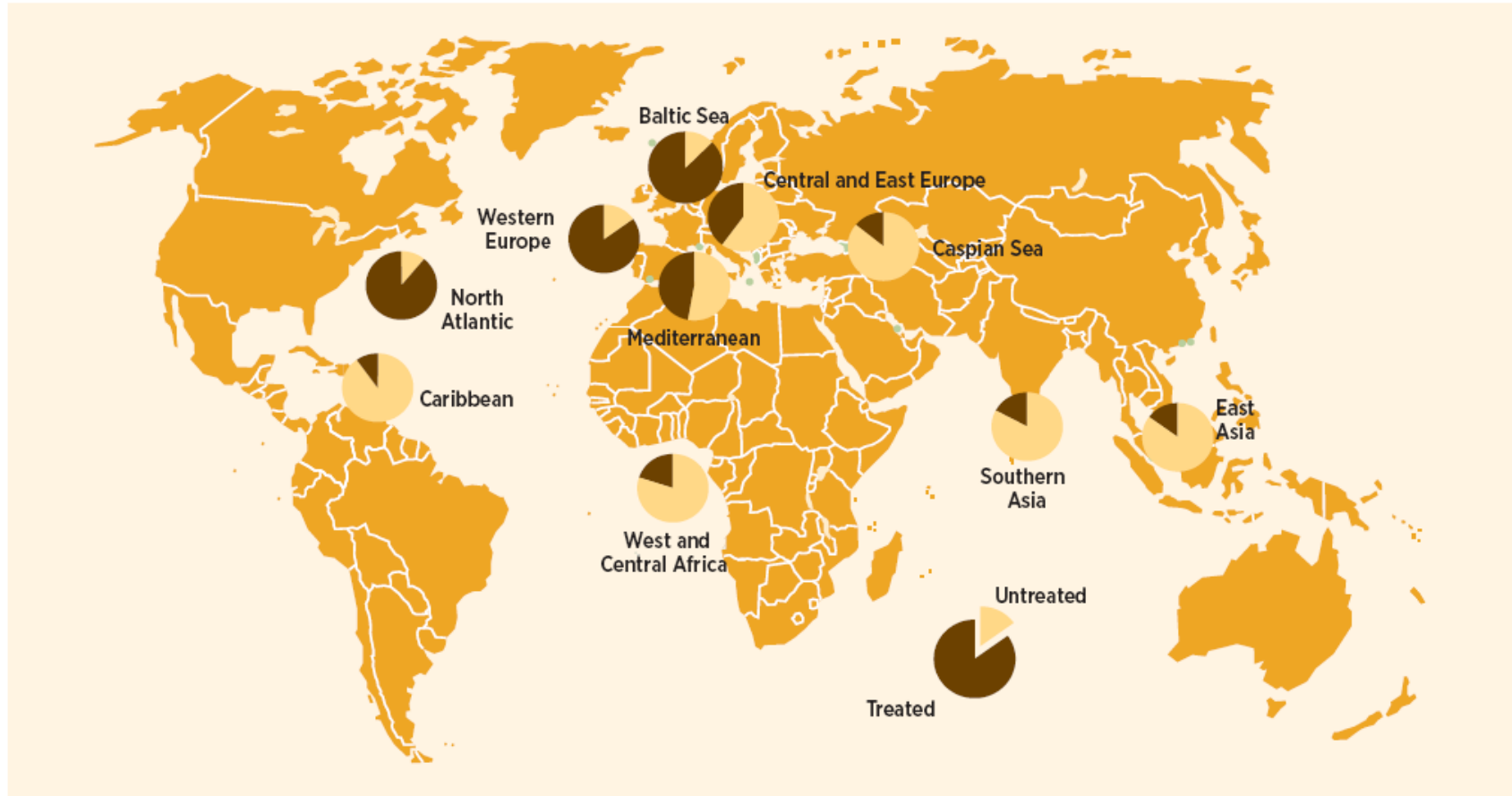


35% do not have access to safe drinking water

Water for health

- **Less than 40% of Sanitation coverage in many African countries**
- **More than 80% of diseases are water related and borne diseases (Malaria, cholera, Guinea Worm,..)**
- **These diseases are mainly responsible for number of deaths for children under five**

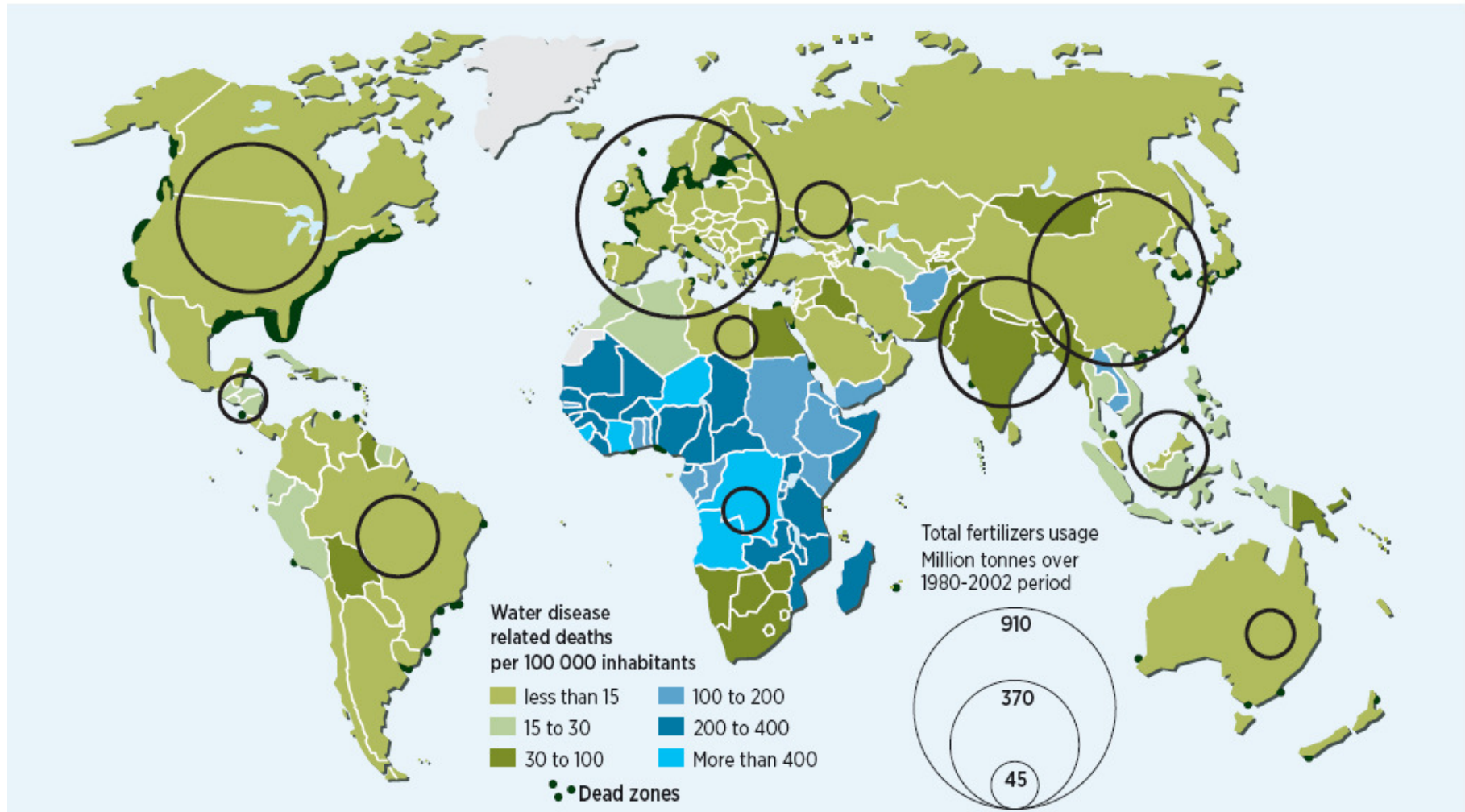
Ratio of treated to untreated wastewater discharged into water bodies



Note: Ratio of wastewater treatment (March 2010).

Source: UNEP/GRID-Arendal (<http://maps.grida.no/go/graphic/ratio-of-wastewater-treatment1>, adapted from a map by H. Alhenius with sources UNEP-GPA [2004]).

Wastewater: A global problem with differing regional issues



Water for Food

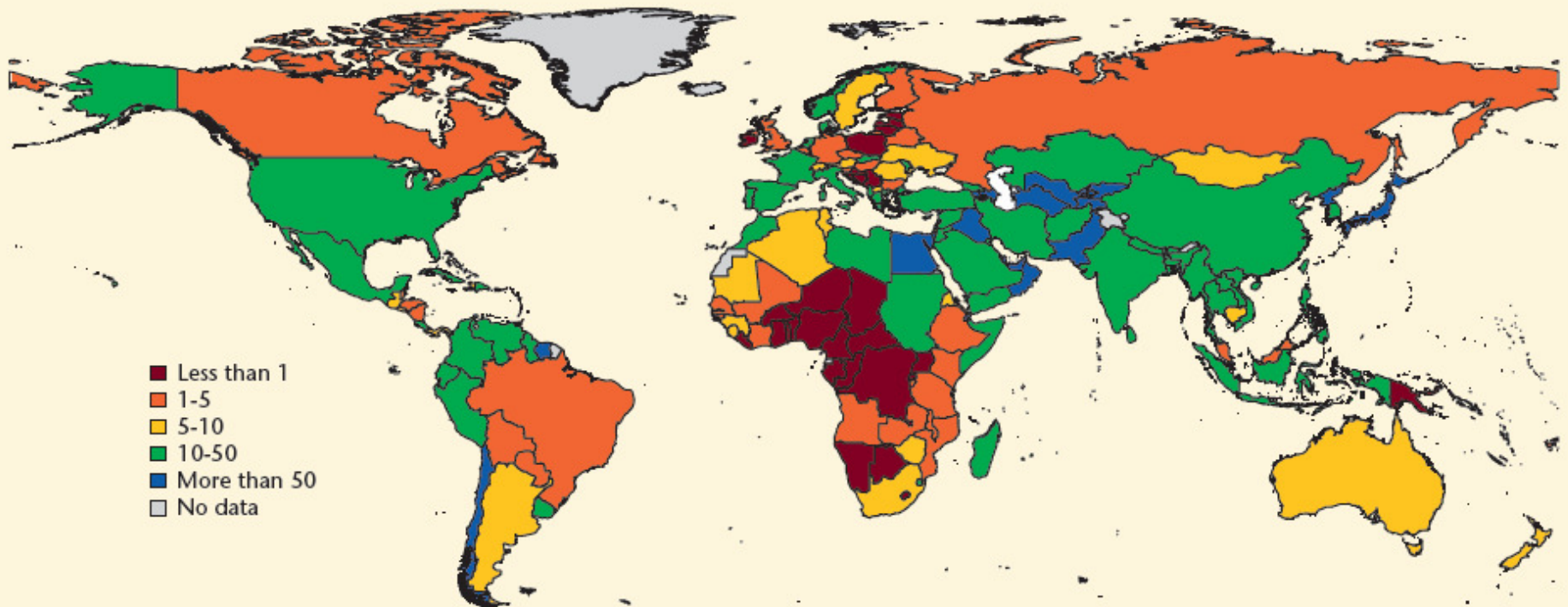


Majority of the population has agriculture as main activities

Agriculture is generally rainfed

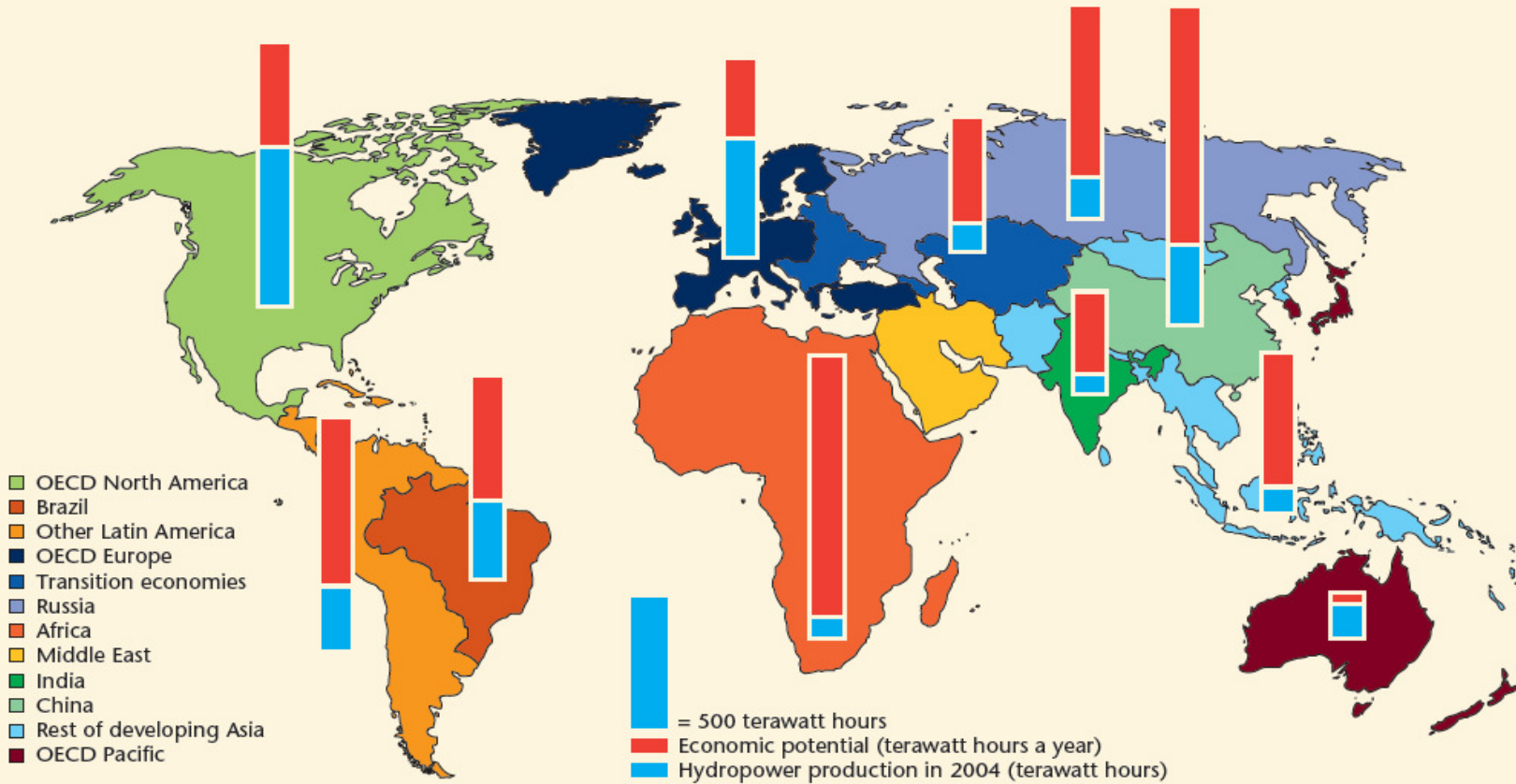
Many African countries continue to struggle with food insecurity

Map 7.5 Percentage of cultivated areas equipped for irrigation, around 2003



Source: FAO-AQUASTAT.

Map 7.6 World potential and current hydropower production, 2004



Source: IEA 2006.

Water related disasters in Africa (floods, droughts)



Mozambique (Février et mars 2000) : Inondations provoquées par le passage des tempêtes tropicales Elyne et Gloria : 1 milliard de \$ US de pertes



Niamey, août 2000



👉 **Collapse of hydraulic infrastructures (under calculated)**

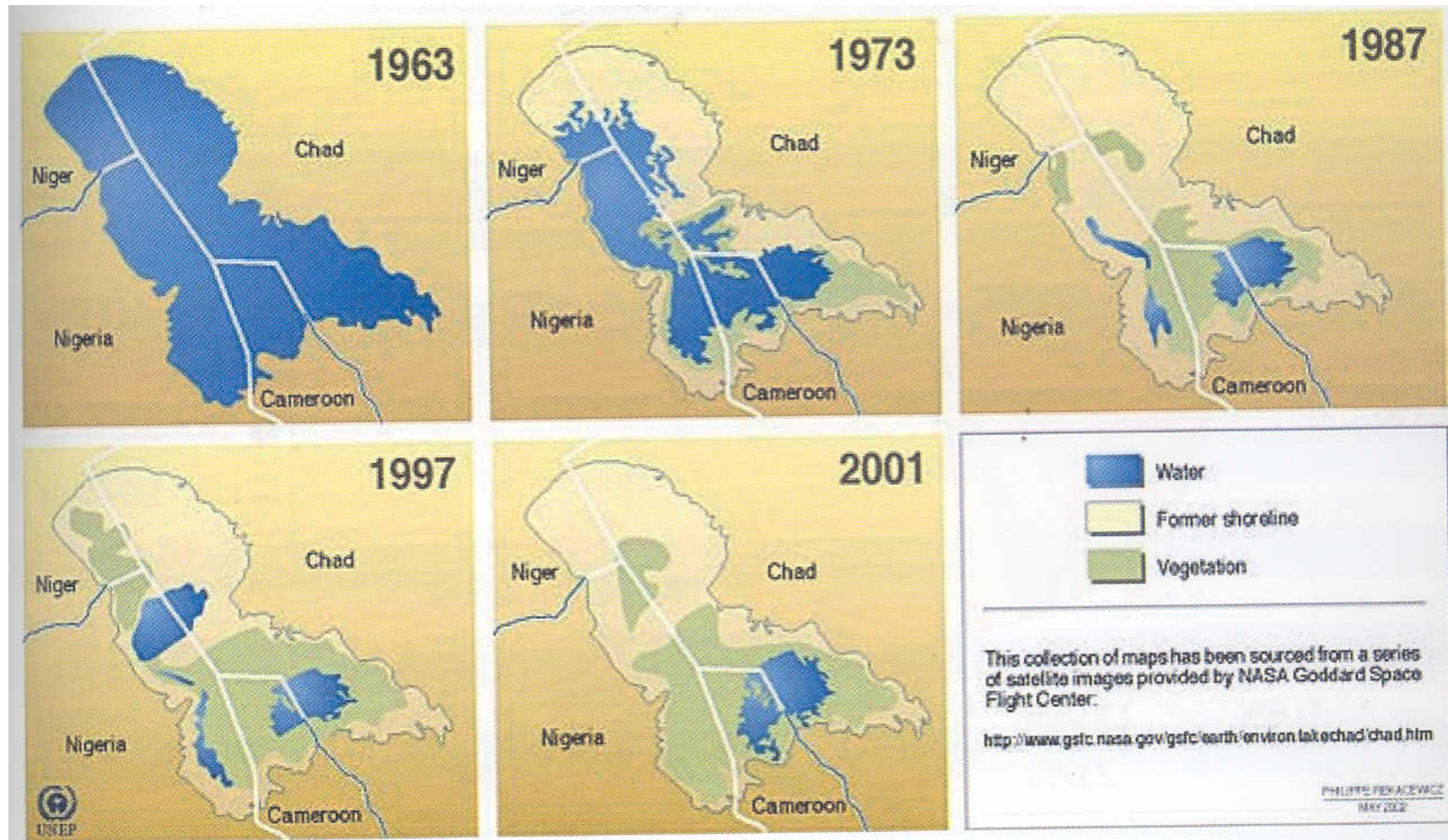
Edi 👉 **Human and environmental threats**

👉 **Increase of water erosion and siltation in reservoirs**





Lake Chad shrinking



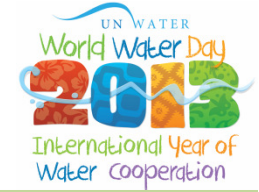


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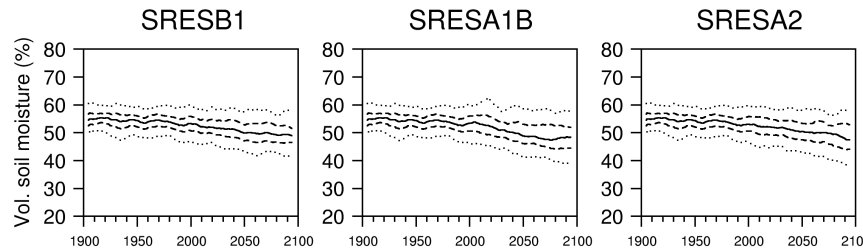


International
Hydrological
Programme

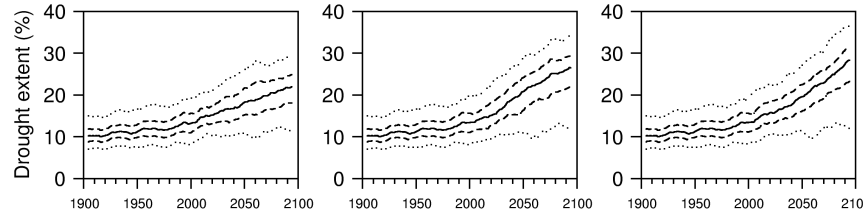
Global Time Series of Future Drought



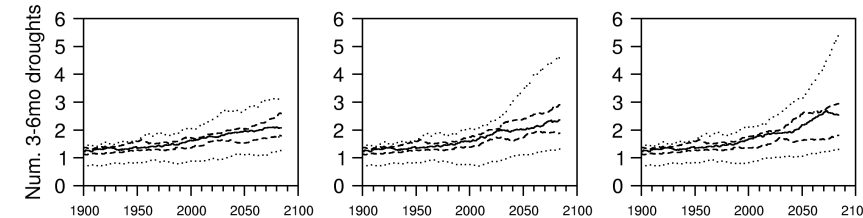
Soil Moisture



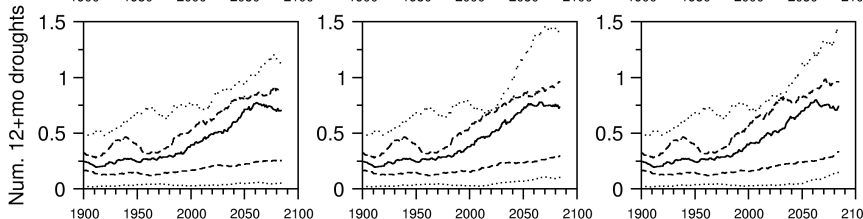
Drought extent



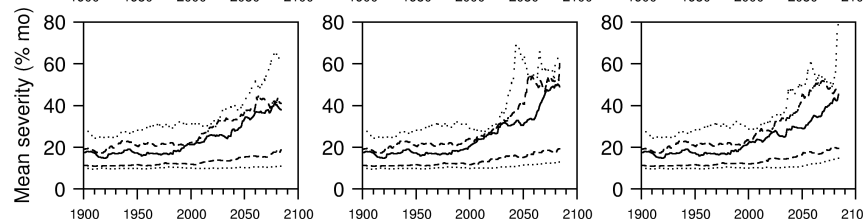
Short term drought



Long term drought



Drought Severity

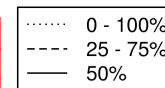


**SRES B1 =
Low Greenhouse
Gas Emissions
(we do something
about climate change)**

**SRES A1B =
High Emissions**

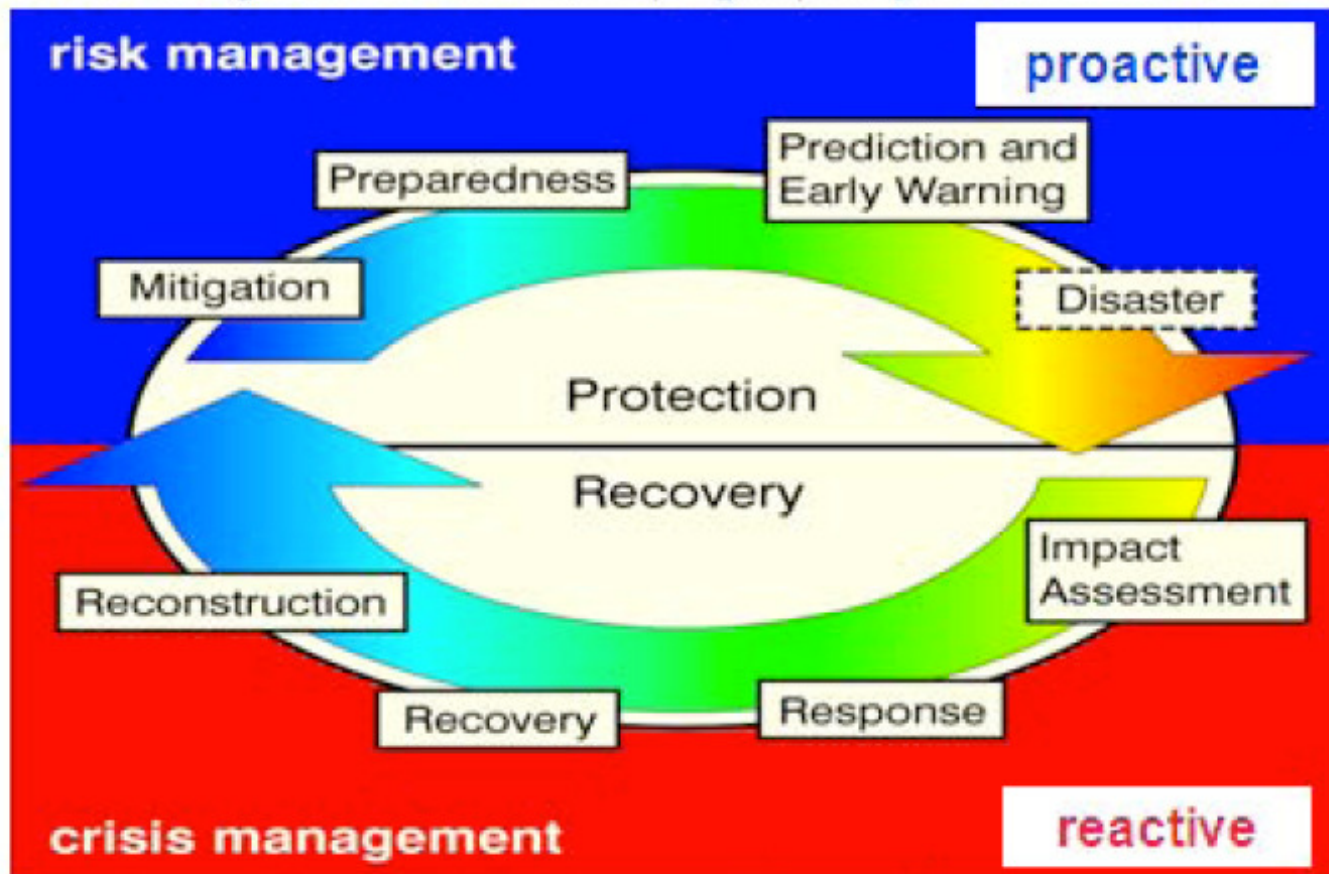
**SRES A2 =
Very High Emissions
(we do little)**

Global average time series of soil moisture and various drought statistics for the 20th (20C3M) and 21st centuries for the SRESB1, SRESA1B and SRESA2 scenarios.



Risk Management vs. Crisis Management

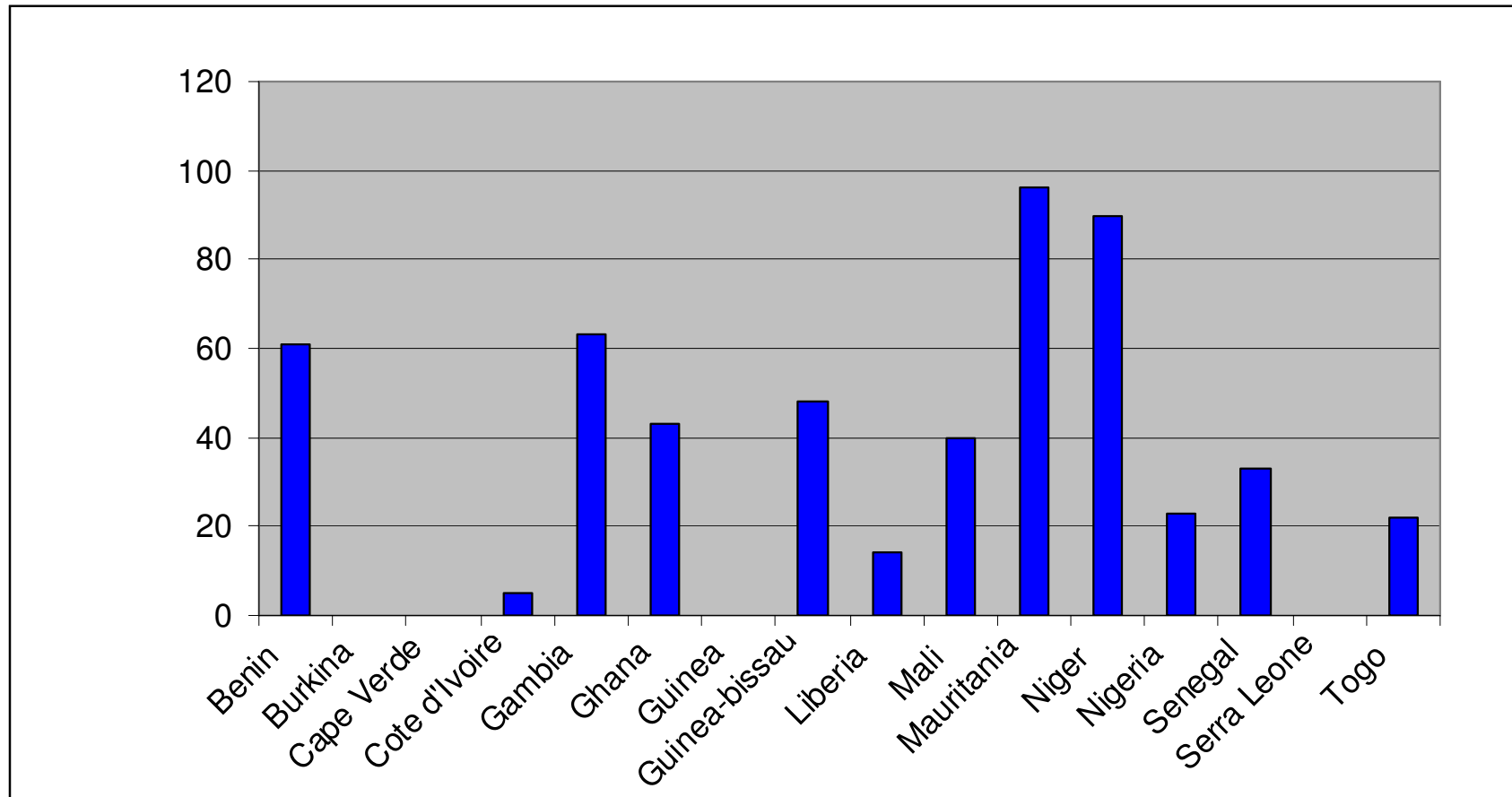
Risk management increases coping capacity, builds resilience.

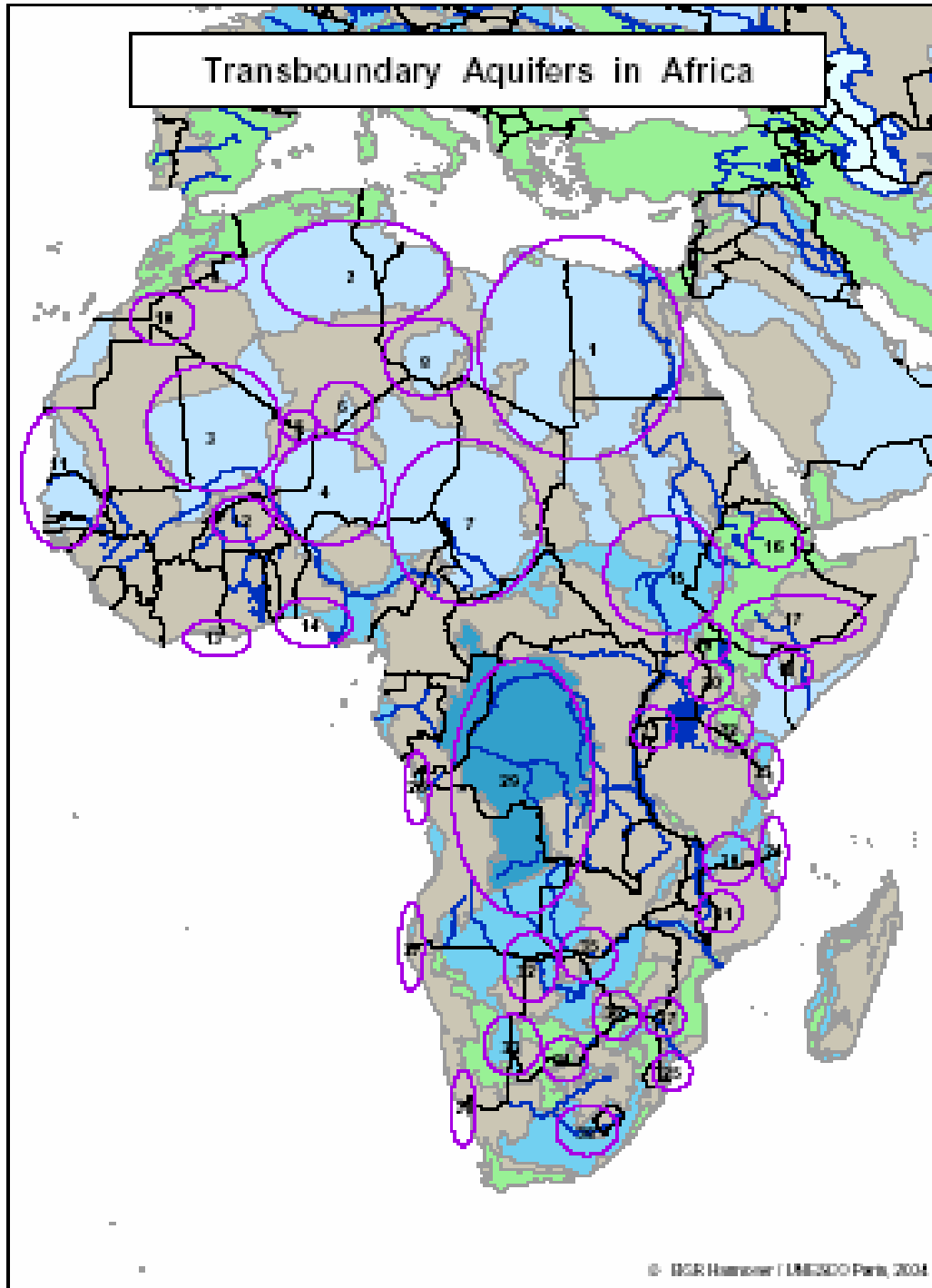


Crisis management treats the symptoms, not the causes.

Transboundary water resources and need for more cooperation among countries in Africa

Water Dependency Index, UNWWDR2, AQUASAT, FAO, 2005





Around 41 transboundary aquifers identified so far

There is a great lack of scientific knowledge on TBA in Africa

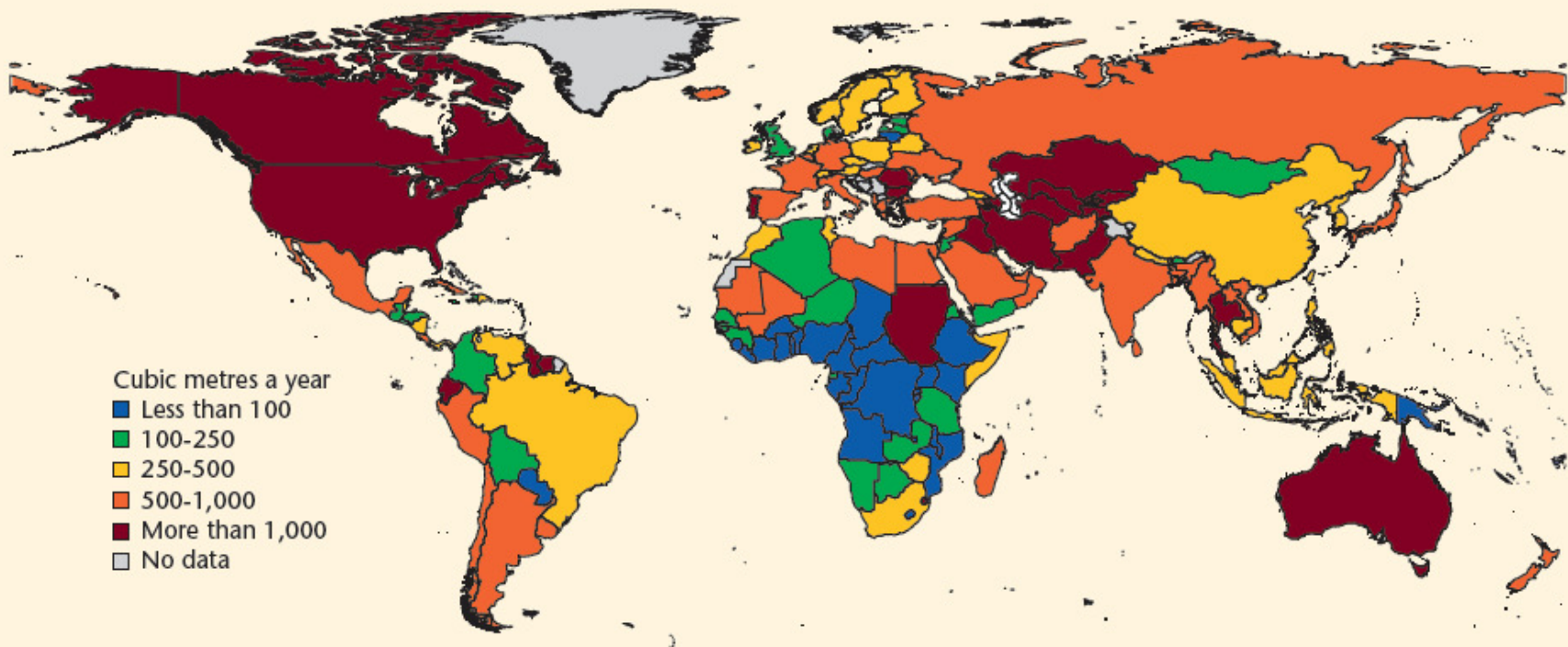
After IHP work, around 60 TBA have been identified in Africa

AFRICAN WATER VISION 2025

Equitable and sustainable use and management of water resources for poverty alleviation, socio-economic development, regional co-operation, and the environment

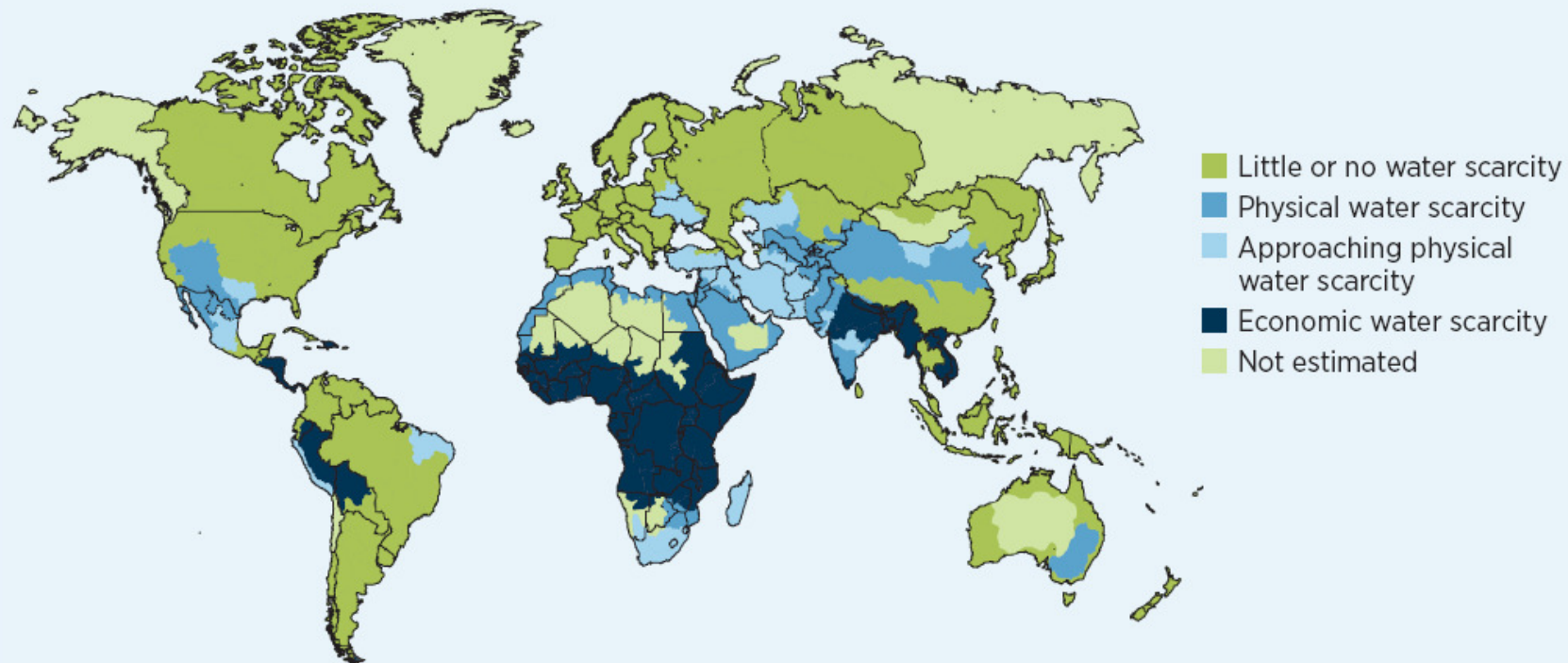
50 billions USD/year needed including investment on water related infrastructures

Map 7.2 Annual water withdrawals per person by country, world view, 2000



Source: Based on FAO-AQUASTAT global maps (www.fao.org/nr/water/aquastat/globalmaps/index.stm).

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Why and How IWRM could contribute to achieve Water Security in Africa?

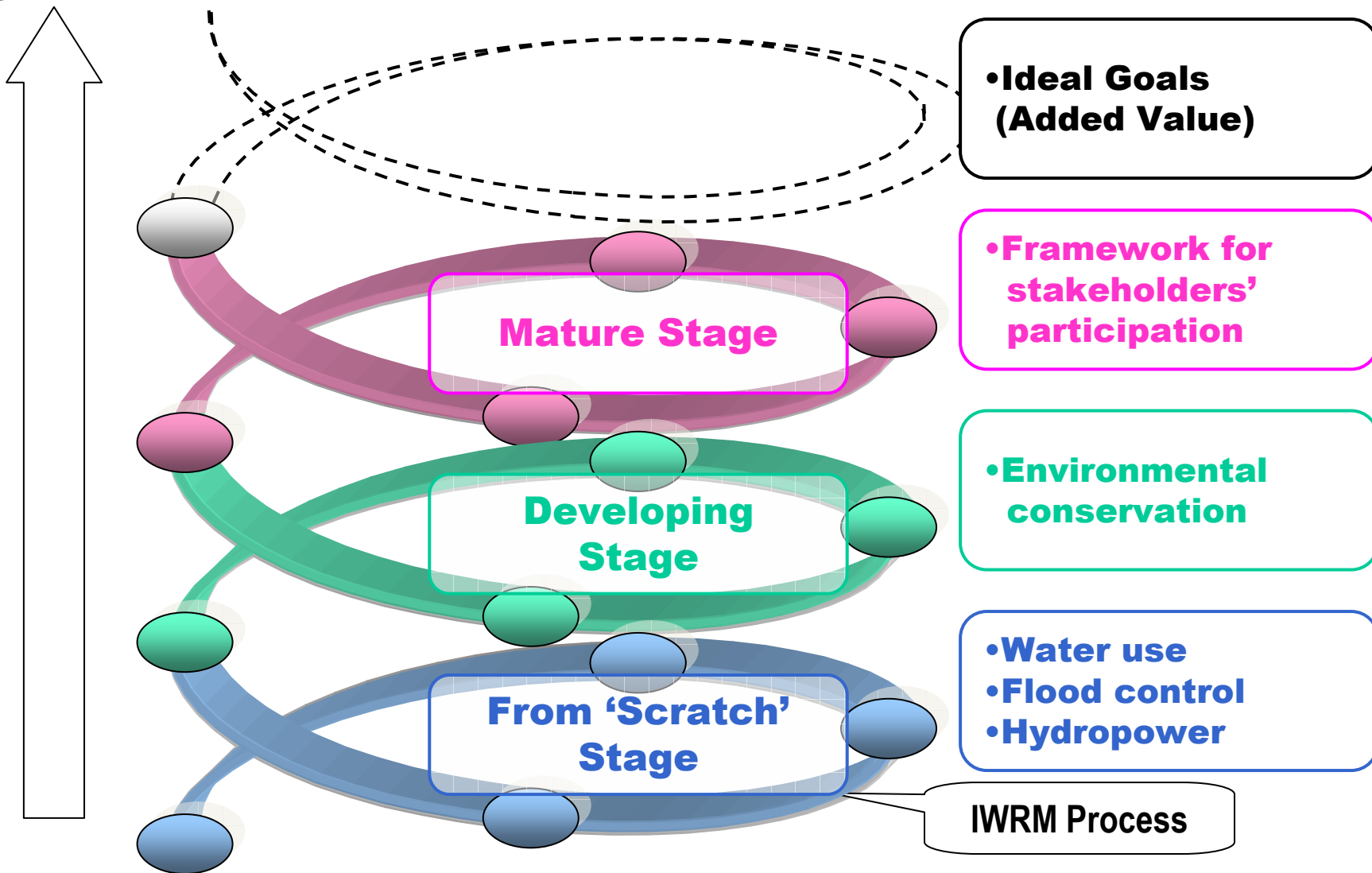
Need for Integrated Approaches: IWRM

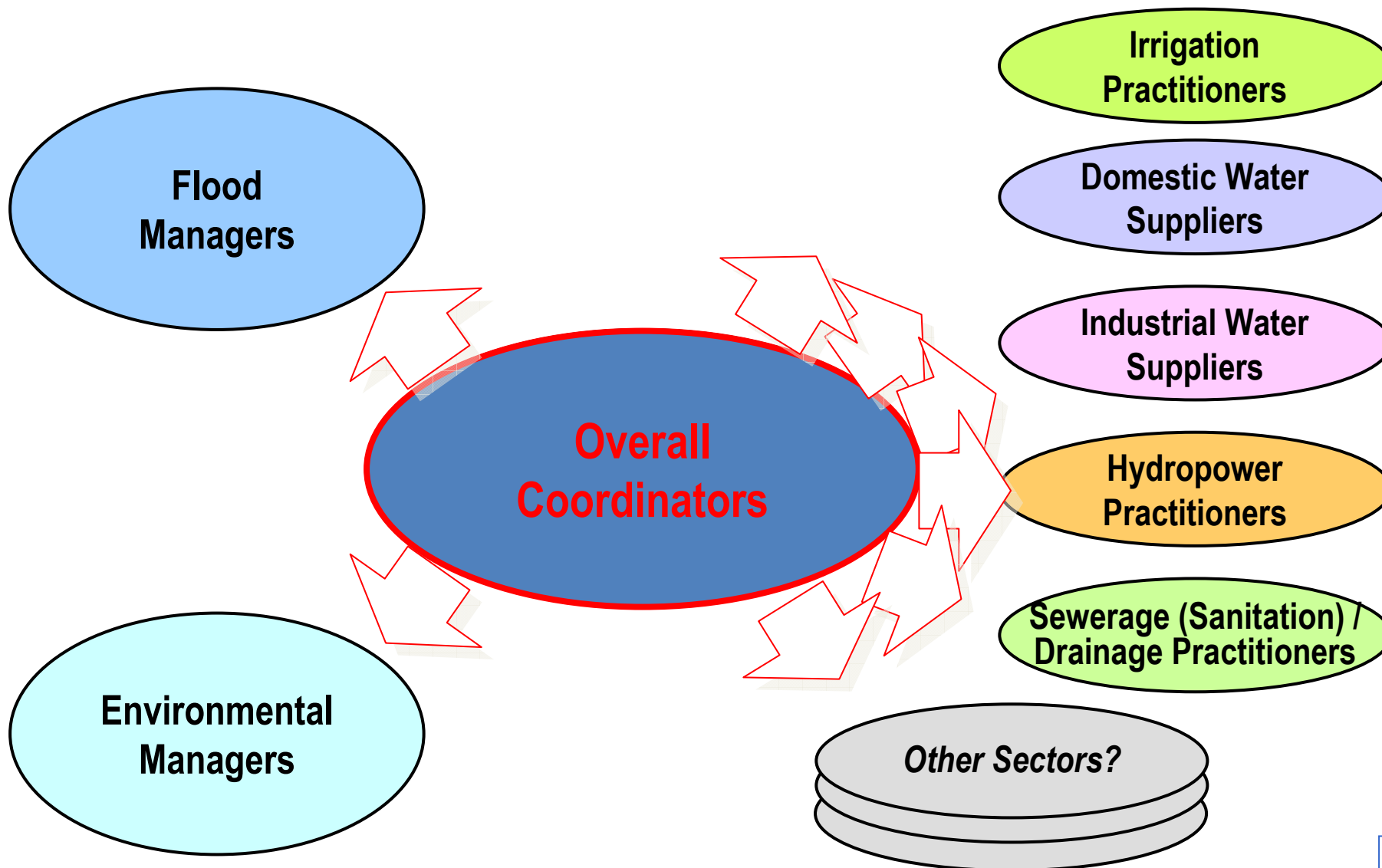
- Population growth
 - More water needed to satisfy the growing needs (domestic, industry, agriculture,..economic growth)
 - More competition on the uses with more pollution
 - More impacts of water related hazards (floods, droughts)
- Shared nature of water resources
 - Need to anticipate potential conflicts among users and countries
- Climate change
 - exacerbating hydro-disasters (floods and droughts)
 - Water availability become more variable in space and time

Need to speed adoption of integrated approach for sustainability supported with sound knowledge and appropriate capacity

Stages of the "IWRM Spiral"

Progress of IWRM





**We cannot manage
something we don't
know**

Major Needs

- More data (quantity and quality)
- More research for policy advice
- Improvement for water management and needs for tools
- Capacity building

Information, Knowledge and Monitoring

The value of information and knowledge is only realized when it is put to use. *Good information → decision making and better choice and design:*

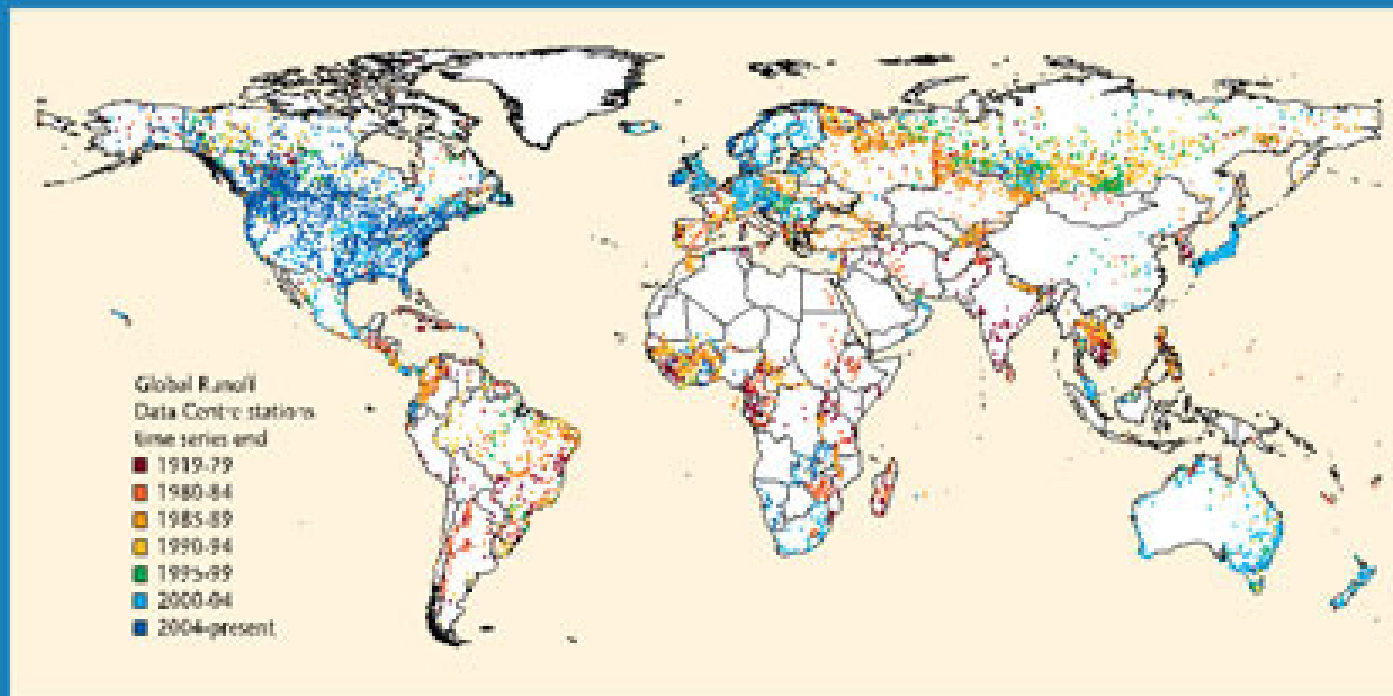
- **Insufficient resources are invested in supply and dissemination of water information in Africa and not enough information is produced**
- **Information that does exist is poorly disseminated and inaccessible and connection between knowledge and operation are weak**



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Lack of information and data at a time when we need it more than ever to deal with increasing complexity



Distribution of Global Runoff Data Centre streamflow gauges (Figure 13.1)



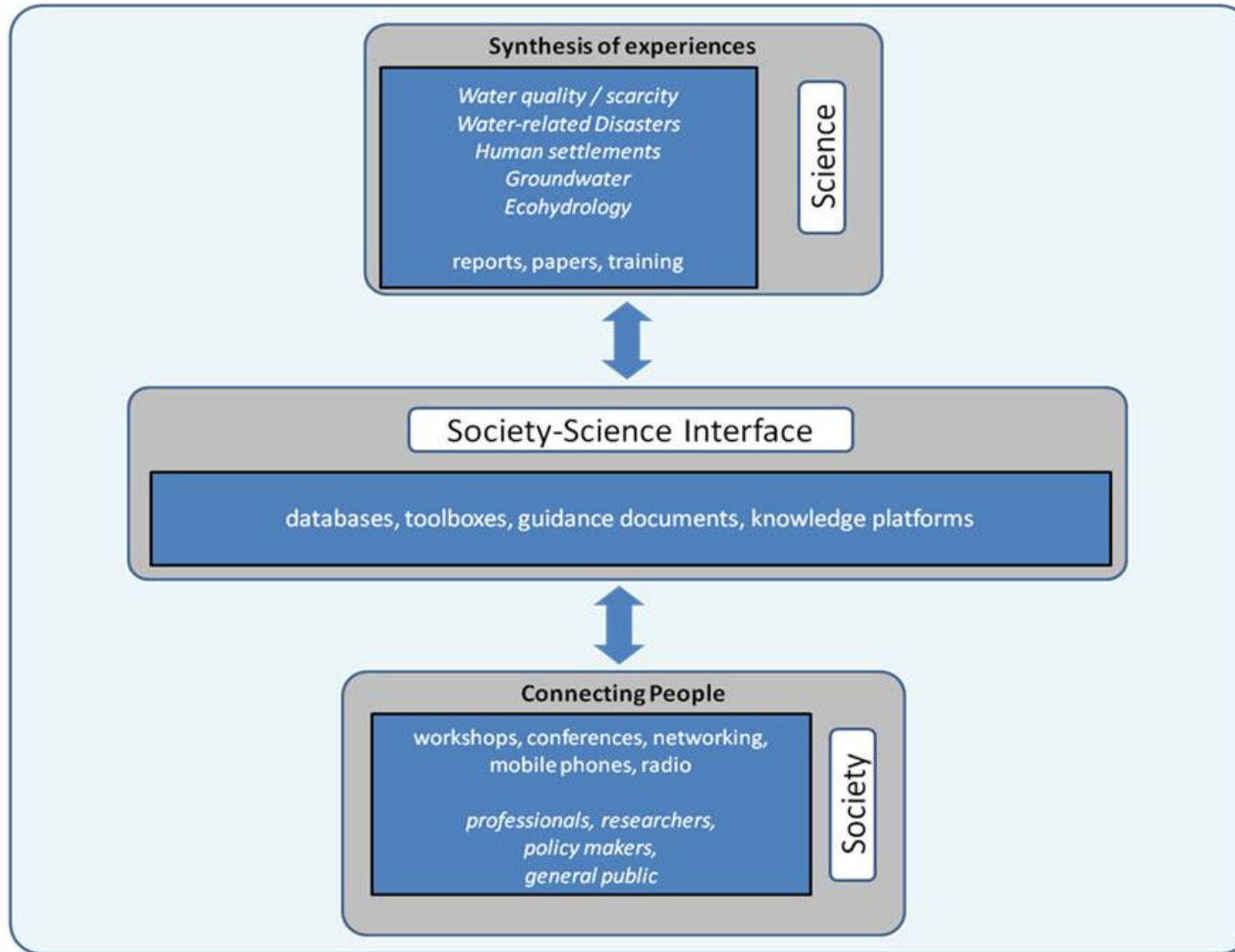
More Research

- **Improvement of knowledge on climate and its impacts on water resources (Ex: Programme AMMA), Climate change models are not still doing well in Africa**
- **Improvement of knowledge on hydrological extremes**
- **Improvement of knowledge on transboundary water systems particularly groundwater**

More management tools

- **Tools for decision making for sustainable management of water resources;**
- **Promotion of IWRM and ecosystem approach for the management of water resources and wetlands;**
- **Identification, promotion and diffusion of technologies and appropriate measures for adaptation to climate change;**

Putting science into action



Roles of AfWCCI

Contribute to address the data and information gap for improving the knowledge base for better water management at basin level

Capacity building, Education and awareness raising on the contribution of Geo-Information for better management

Enhance cooperation, synergy and harmonization

Way forward

- Achieving Water security is a necessity for African countries for their socio-economic development
- Sustainable and peaceful management of water resources in Africa must be promoted through holistic approaches (IWRM) working at basin level with RBOs
- Synergy, cooperation and coordination of different initiatives are indispensable

Building on IHP-VIII 2014-2021



Water-related
Disasters and
Hydrological
Change



Groundwater
in a Changing
Environment



Addressing
Water Scarcity
and Quality



Water and
Human
Settlements of
the future



Ecohydrology,
Engineering
Harmony for a
Sustainable
World

Water Security: Responses to Local and Global Challenges

Thank you for your kind attention