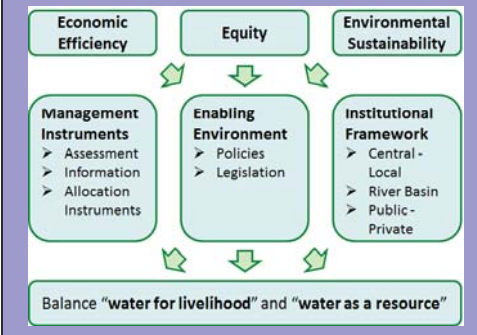




Source: GWP



# Integrated Water Resources Management (IWRM) – Principles

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Module: Ecology & Water Resources

WATENV International Master Programme

## Lecture 1: IWRM Principles

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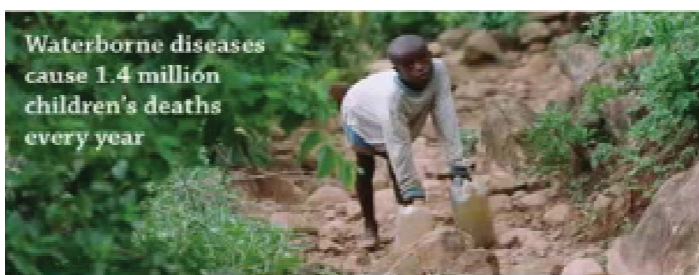
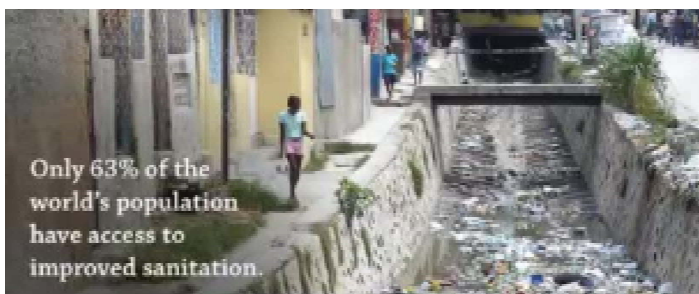
- 1 IWRM Definition and Principles
- 2 Participation
- 3 Capacity Building

# 1 IWRM Definition and Principles

„Water crises are water management crises.“

*UN World Water Development Report 3, 2009*

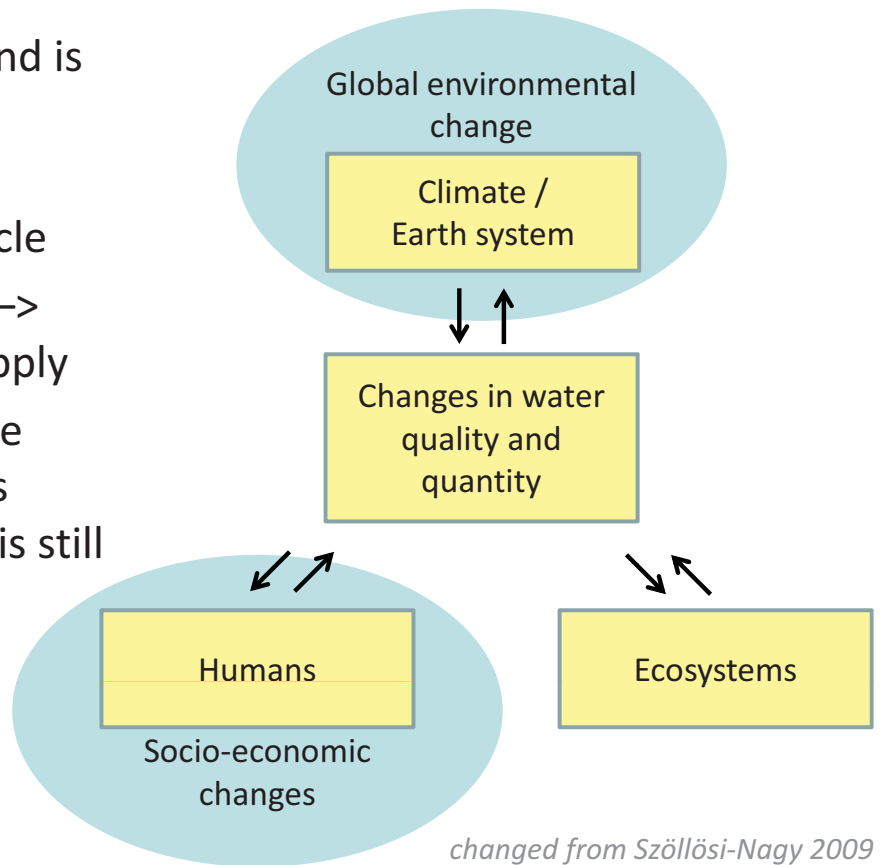
## The way we use our water



Graphics:  
IHP/IWRP-Secretariat, Germany

# Why do we need a better Water Management?

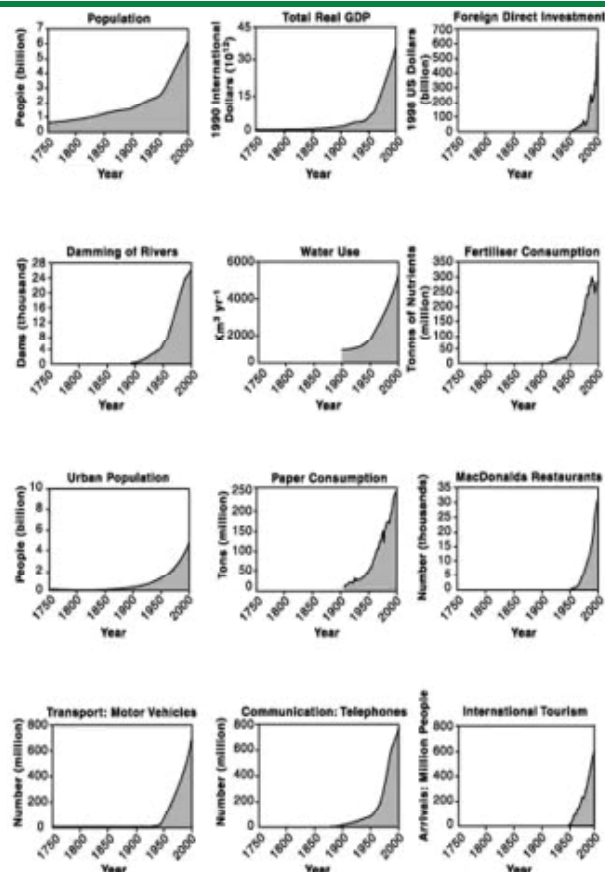
- Human water demand is rapidly increasing
- Climate change will impact the water cycle
- Increased pollution → decreased water supply
- Knowledge about the water system and its response to change is still insufficient
- Sectoral approaches cause a water governance crisis!



*changed from Szöllösi-Nagy 2009*

# Drivers of Global Change

- Population growth and movement (urbanization, megacities)
- Geo-political changes
- Economic changes (growth, globalization, poverty)
- Loss of biodiversity
- Land use change
- Climate change / variability



*Steffen et al. 2004*

# Why do we need a better Water Management?

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Source: Global Water Partnership- IWRM at a glance

# Future Challenges in Water Resources Management

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- **Regionally adapted** integrated approaches
- **Sustainable** and optimal distribution and uses of water resources (surface and ground water) without quantitative or qualitative over-use
- Considering **ecological** functions of water resources
- Increasing **efficiency** of water uses
- Social **equity**

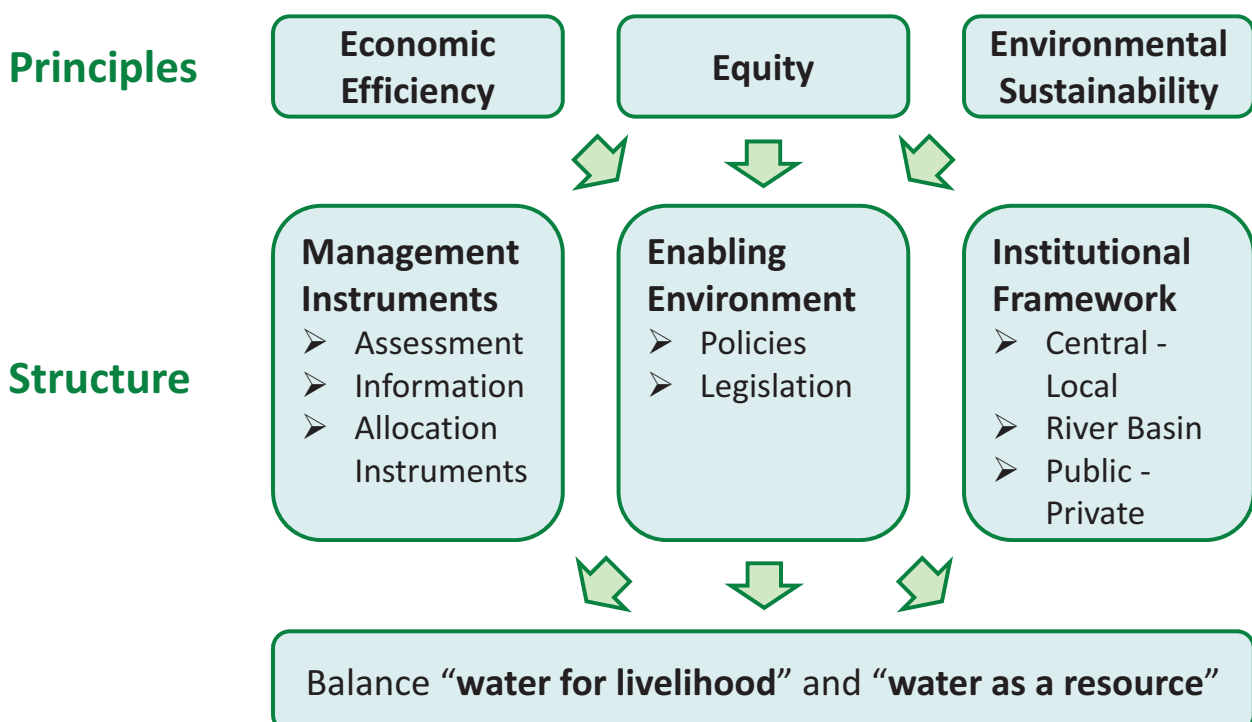
## GWP Definition of IWRM

“Integrated Water Resources Management (IWRM) is a **process** which promotes the coordinated development and management of water, land and related resources, in order to **maximize the resultant economic and social welfare** in an **equitable** manner **without compromising** the sustainability of vital **ecosystems**”

(GWP 2000)

- IWRM is rather a conceptual framework than a specific and dogmatic manual at the operational level.

## IWRM Components



## History of IWRM

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- 1913: Ruhrverband, Germany: river basin as planning unit, specific legislation and authority for water management, balance of industrial development, drinking water supply and water quality
- 1933: Tennessee Valley Authority, USA: river basin as planning unit; economic, social and environmental objectives of water resources planning
- 1977: United Nations Water Conference, Mar del Plata: “Ensuring that the world has an adequate supply of good quality water to meet the socio-economic needs of an expanding population” (Biswas 1978)
- 1990 US Negotiated Rulemaking Act (participation)

## History of IWRM

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- 1992: Int. Conference on Water and the Environment, Dublin: water management principles (“Dublin Principles”)



UNESCO- P.Coles



Community participation in Birki IWRM project, Ethiopia



M. Leidel



Cap-net 2006, Photo: Gert-Jan Veldwisch

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- Water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels.
- Women play a central part in the provision, management and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognised as an economic good.

## History of IWRM

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- 1992: Earth Summit in Rio de Janeiro (UNCED), Agenda 21
- 1998: Aarhus Convention on access to information, public participation in decision making and access to justice in environmental matters
- 2000: EU Water Framework Directive (EU-WFD)
- 2000: UN Millennium Summit: Millennium Development Goals (MDGs)
- 2002: World Summit on Sustainable Development (WSSD), Johannesburg: IWRM and water efficiency plans by 2005
- 2005-2015: UN Int. Decade for action: “**Water for Life**”

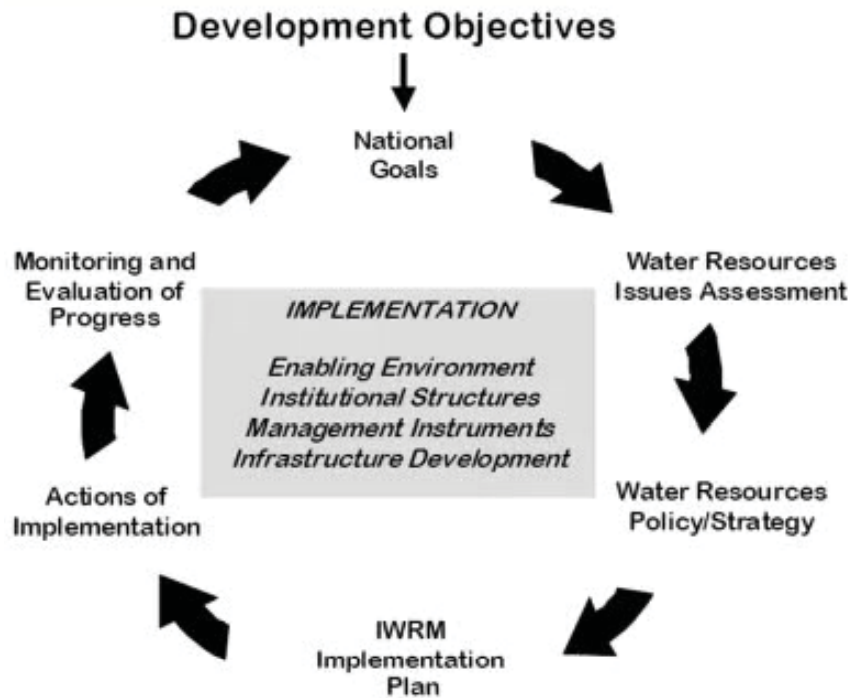
## Is IWRM effective? – Some critical thoughts

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*„IWRM continues to be **amorphous**, and there is **no agreement on fundamental issues** like what aspect should be integrated, how, by whom, or even if such integration in a wider sense is possible. ...**in the real world, the concept will be exceedingly difficult to be made operational.**“*

Asit Biswas, Water International 29 (2), 2004.

# Implementing IWRM

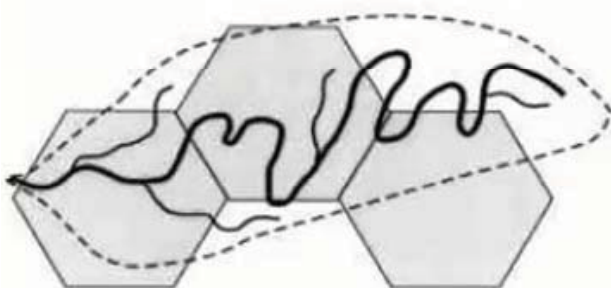


Source: UN-Water and GWP 2007, adapted from Global Water Partnership Technical Advisory Committee (2004): *Catalyzing Change: A handbook for developing integrated water resources management (IWRM) and water efficiency strategies*.

# Implementing IWRM: Challenges

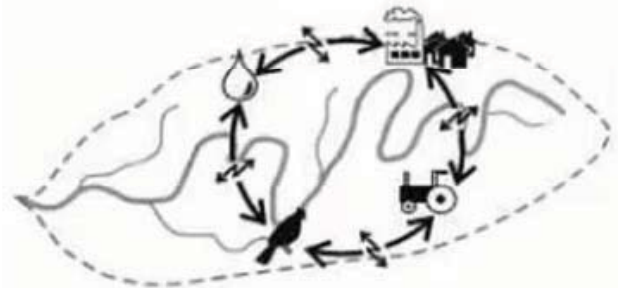
## Spatial Fit

- Incompatibility between institutional arrangements and natural systems



## Interplay

- Interaction between different institutions and responsibilities



Source: Moss 2003



## Implementing IWRM

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- IWRM implementation means **change** (threat and opportunity)
- IWRM implementation needs **platforms** for stakeholders
- Implementing IWRM is considered to support the **MDGs**
- EU Water Framework Directive (WFD) as example
- Worldwide implementation still dissatisfying (UN-Water 2008)
- Adaptation to the specific country or region necessary (UN-Water 2008)

## Integration: Extending traditional WRM approaches

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- Inter-/ Transdisciplinarity: **multi criteria** planning and decision making  
*WRM II lecture/exercise*
- **Participation**: people are actively involved in the management of natural resources
- **Capacity development (CD)**
- **Risk** based approach: dealing with uncertainties, hazards and vulnerabilities
- Awareness of **global change**: climate change, socio-economic change (population growth, poverty, gender etc.)
- **Water policy**: planning and adaptation
- Link between global and local problems of the **regions of the world** (“think globally, act locally”)

## 2 Participation

„The lack of community involvement causes 50 % of water projects to fail.“

“98 % of microfinance loans prove successful and are repaid.”

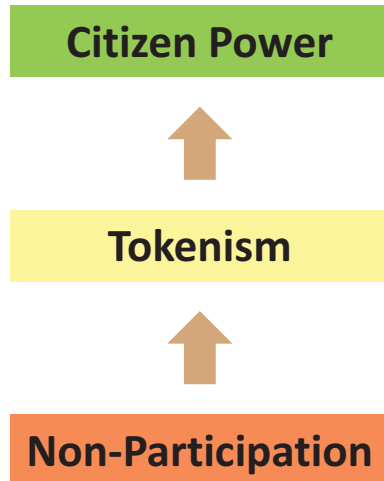
*Source: [www.water.org](http://www.water.org)*

### 1992 Dublin Statement: IWRM principles

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1. *Fresh water is a finite and vulnerable resource...*
2. *“Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels – **The participatory approach involves raising awareness of the importance of water among policy makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.**”*
3. *Women play a central part...*
4. *Water has an economic value...*

# Ladder of Citizen Participation



*Power based typology  
changed from Arnstein (1969)*



# Definition of Public Participation

- Working definition: public participation comprises all forms of **public decision making** in which **non-state actors** (individual or collective), who are not routinely engaged in this decision making and who broadly represent those who are **affected** by the decision or the problem it seeks to address, have a **substantial influence** on a collectively binding decision through a minimum of open input.
  - Processes: **how** are decision being taken?
  - Actors: **who** participates in decisions?
- Difference to concepts of “elections” or “engagement”

*Newig 2012 drawing on concepts by Renn 2005 and Rowe & Frewer 2005*

## Three Dimensions of Participation

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- **Scope** of participants (citizens, NGOs, industry, government, ...)
- Direction and intensity of **information flow** (information, consultation, face-to-face deliberation...)
- **Influence** participants are given and the influence they actually exert on the decision at stake

*Newig 2012 drawing on ideas by Fung 2006, changed*

## The Instrumental Claim

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### 'Better' decisions through participation

- More informed decisions through local knowledge
- More 'ecological' decisions due to involvement of citizens and environmental groups
- More creative decisions through deliberation and exploration of win-win potentials

### Enhanced implementation

- Better information/education of target groups
- Better acceptance and identification with decision
- Improved compliance
- Less litigation, swifter implementation

Improved water management

- ▶ More complete and swift implementation of measures

*Newig 2012*

## Local vs. Higher Level Decision Making

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- Citizens living in close spatial **proximity** to a natural resource tend to favour its economic **exploitation**, whereas those living **farther** away tend to favour its **conservation**.
- Where decision competences regarding **environmental issues** are at lower levels of governance, a stronger and more influential participation of citizens with **economic interests** can be expected.

*Koontz 1999*

## Rationales and Drawbacks of Participation

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### Pros:

- Emancipatory potential: empowerment and self-determination
- Better transparency and legitimacy of decisions
- Social learning
- Better informed decisions
- Higher acceptance and identification
- More effective water governance
- ...

### Cons:

- Illegitimate influence of powerful interests (rational actors tend to over-use scarce resources)
- High number of veto players
- Decision at lowest common denominator
- Replacing expertise by opinion
- Group think and manipulation (social psychology)
- Costly
- ...

*changed from Newig 2012*

## Example: Fisheries in Alanya (Turkey)

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- Local fishery cooperative (approx. 100 fishers) develops own rules for managing their fishing sites
- Fishers are allocated by chance to certain fishing locations (May - September)
- Rotating system because of fish migration: equal chances for each fisher to fish at the best sites; no over-fishing, no resources for conflict resolution needed
- Monitoring and enforcement through the fishers themselves: hardly any violations of rules



*Newig 2012*

*Photo: Andra Moclinda-Bucuța, flickr.com*

## Methods of Participation

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- Hearings
- Internet Consultation
- Citizens' juries / planning cells
- Public deliberative forums
- Citizen advisory committees
- Stakeholder dialogues
- Consensus workshops
- Watershed partnerships
- ...

*Newig 2012*

## Guideline for Conducting Participation: Relevant Issues

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- Reflect on the **goals**: is participation desirable? Why?
  - Seeking expertise? Legitimacy? Better implementation?
  - Consider possible trade-offs and alternatives
- **When** to conduct participation?
- **Who** to include? Conduct a stakeholder analysis
  - Experts? Interest groups? Citizens?
- Plan for the necessary **resources**
  - Staff time, expenses of participants, external facilitator/mediator?
- Careful choice of participation **methods**
- Clarify **scope** of process / roles and responsibilities
  - “Expectation management”
- **Learn** from the process: monitor and evaluate approach and results

*Newig 2012*

## Typical Key State Stakeholders

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- Government Ministries involved in national or federal state development planning and policy making
- Government Ministries involved in key water-related sectors, including domestic water supply and sanitation, irrigation, agriculture, energy, natural resources, health, industry, transport, fisheries, tourism,...
- Water utilities, agencies and related bodies (e.g. Water Boards)
- River Basin Commissions (can be transboundary, e.g. Rhine)

*Changed from GWP 2004*

## Typical Key Non-State Stakeholders

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- Local communities and community-based organizations (e.g. mayors and religious leaders)
- The private sectors, including but not limited to water supply and sanitation service providers
- Financial agencies (e.g. donor agencies, international banks, micro-credit institutions)
- Sectoral interest groups such as farmers and fishermen
- Women's groups and associations
- Representatives of indigenous communities
- Non-government organizations
- Media representatives
- Research and training institutions, including universities

*GWP 2004*

## Success Factors for Participation

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- Choice of participation method tailored to context
  - Level of governance (local ... global)
  - Phase in the policy cycle (agenda setting – policy formulation – implementation)
  - Spatial fit
- Capacity on the part of the participants
  - Awareness
  - Knowledge
  - Willingness to engage

*Newig 2012*



## 3 Capacity Development

„In the context of IWRM, the importance of training and capacity building cannot be overemphasized.“

Theresa Mkandawire, Wapulumuka Mulwafu (2006): An analysis of IWRM capacity development needs in Malawi. *Physics and Chemistry of the Earth* 31: 738-744.

### Capacity Development Definitions

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- Process **whereby people**, organizations and society as a whole unleash, strengthen, create, adapt and maintain **capacity** over time (OECD/DAC).
  - Process of **strengthening** the abilities of individuals, organizations and societies to make effective **use of the resources**, in order to achieve their **own goals** on a **sustainable** basis (GTZ/GIZ).
  - Process of **increasing the effectiveness and efficiency** with which a **country** mobilizes and uses resources to identify, achieve and sustain its **development objectives** (World Bank).
- An endogenous, long-term learning process which cannot be rushed, and for which there are no blueprints

## Capacity Development Definitions

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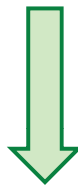
The rate of technological change is constantly increasing



Technological solutions are not sufficient, respective budgets are often declining



Need for local capacities to manage, operate and maintain facilities after the initial round of funding is finished.



Main pillar for an action's ability to result in an impact that **exceeds the respective effort's duration**

Research & Implementation & **Capacity Development**

Sustainability

*Niemann & Leidel 2012, modified*

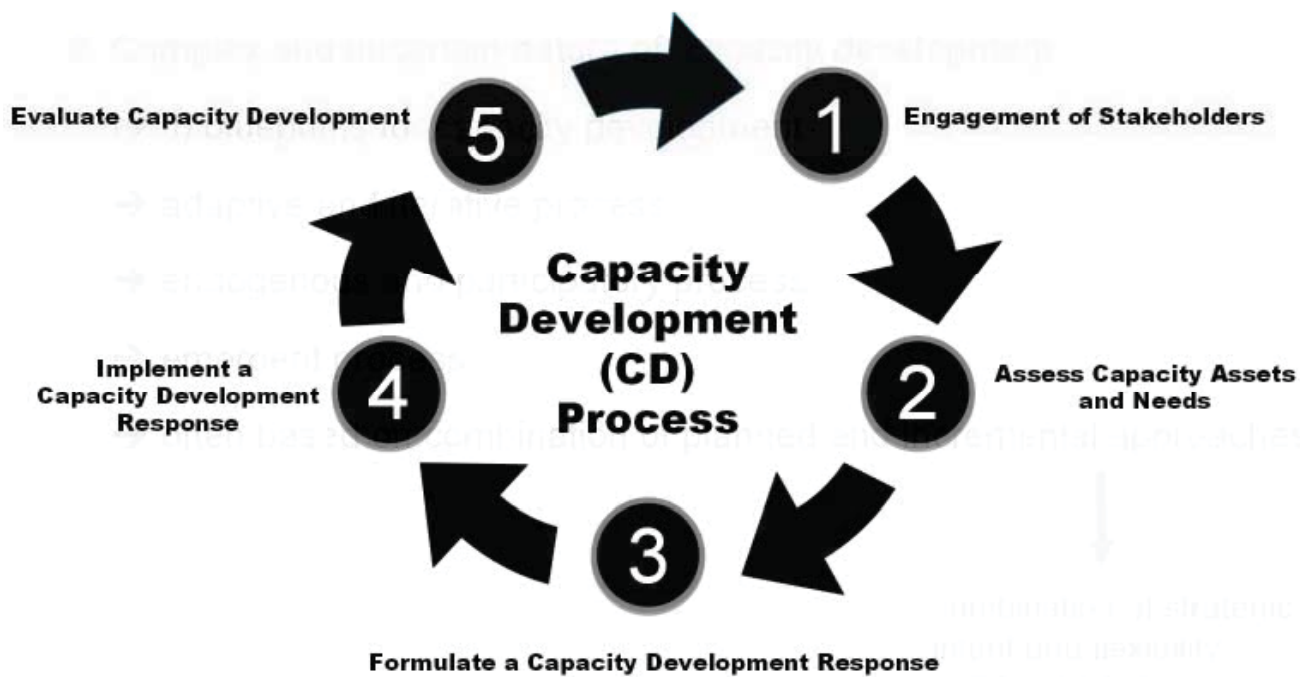
## IWRM and Capacity Development

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- Capacity development as decisive factor for sustainable development and for reaching the MDGs
- Capacity development essential part for successful IWRM projects:
  - IWRM is complex
  - Often low capacities in the water sector institutions
  - Insufficient and overlapping policies and laws
  - Unclear responsibilities
  - Intra-sectoral collaboration inadequate
  - Inadequate incentives
  - Inadequate IWRM research and education
- Strong interlocking between IWRM and CD necessary
- CD as key for successful IWRM implementation

*Niemann & Leidel 2012*

# UNDP Capacity Development Process



UNDP 2008

Integration of CD-processes in national development plans

## CD 1: Engagement of Stakeholders

- Stakeholder and institutional analysis
- Participation and commitment of key stakeholders necessary (ownership and accountability)
- Strengthening relational capacities of stakeholders
- Priority/target setting

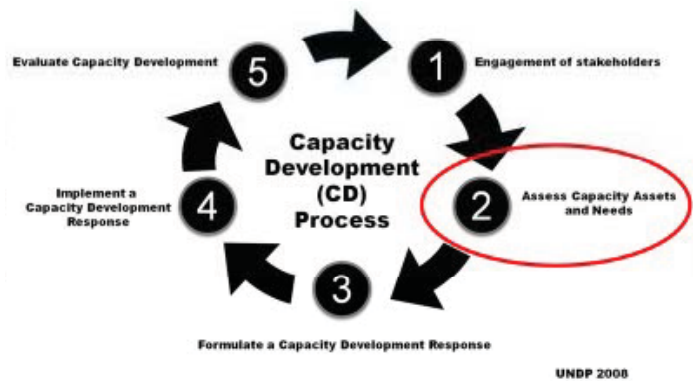


UNDP 2008

*changed from Niemann & Leidel 2012*

## CD 2: Assess Capacity Assessts and Needs

- Systematic method for identification of existing and missing capacities
- Baseline for measuring progress
- Participation of key stakeholders
- Essential step for CD responses
- Priorisation of capacity needs and responses
- Core issues (institutional arrangements, leadership, knowledge, accountability)
- Technical and functional capabilities (e.g. capacity to evaluate)
- Points of entry (multi-level approach)



*changed from Niemann & Leidel 2012*

## CD 3: Formulate Capacity Development Response

- CD responses based on existing capacities
- Short and long term responses
- Transparency, involving stakeholders
- Calculation of required funding
- Developing indicators for measuring progress
- Increased effectiveness if combined across core **issues** and **levels** of capacity



*changed from Niemann & Leidel 2012*

## CD 4: Implement Capacity Development Responses

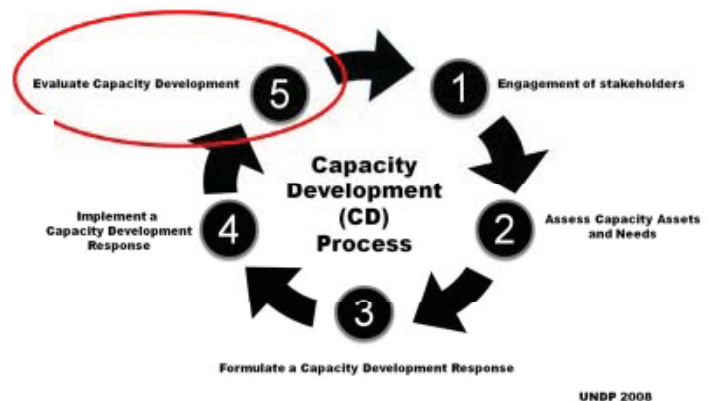
- Implementation through national systems and processes
- External expertise may be appropriate but „exit-strategy“ needed
- Implementation of responses means change and change means threats as well as opportunities



*changed from Niemann & Leidel 2012*

## CD 5: Evaluate Capacity Development Responses

- Measurement of capacity development is more than an evaluation of input resources (e.g. human or financial resources)
- Progress can be measured by improved capacity
- Improved capacity is reflected by changes in the core issues
- No direct cause and effect relation between CD responses and impact



*changed from Niemann & Leidel 2012*

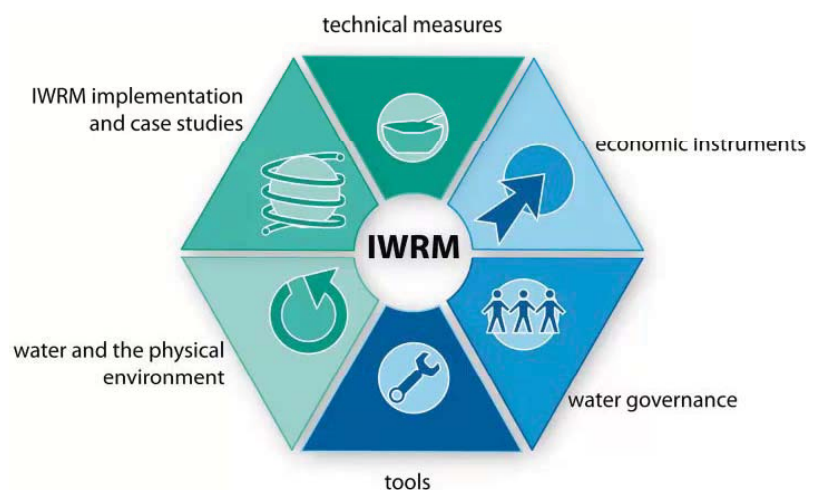
# Success Factors of Capacity Development

- Manage the complexity of capacity
  - Emergent development of capacities by incremental/iterative approaches
- CD is a long term process and a key factor for IWRM
- Profound analysis of the situation for functional IWRM
- CD responses for improving governance and “soft skills”
- CD and participation of all involved levels
- Enhancement of the academic education in the water sector
- Development of formal and informal networks for social learning

*changed from Niemann & Leidel 2012*

# References: Online IWRM Lectures

- Improve IWRM research and education
  - Interlinked E-learning modules dealing with IWRM that complement classical learning options, e.g. <http://www.iwrm-education.org> (from which parts of this lecture are recombined)
- Target groups
  - Graduating students in water-related fields
  - Decision makers and water related professionals
  - Administration staff in developing countries



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Thank you for your attention!

## Integrated Water Resources Management Principles

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