

**Southeast Asia Water Forum
Kuala Lumpur
October 2007**

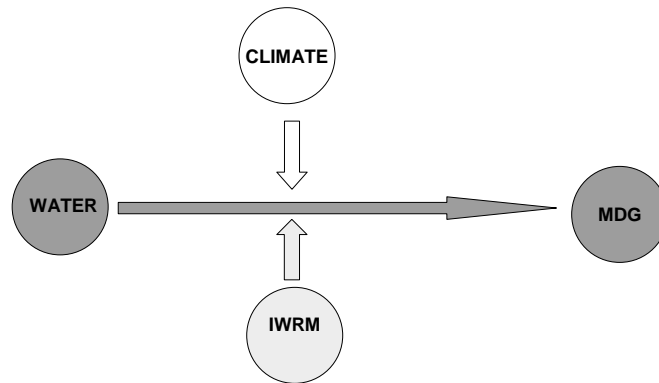
**Water and climate change – the added
challenge to achieve the MDGs**

*Prof. Torkil Jønch-Clausen
Managing Director, DHI Water Policy
UNEP-DHI Centre on Water & Environment*

The context



**The context:
Climate change as an added challenge to
achieve the MDGs**



Water and climate change

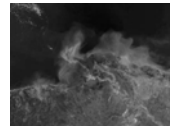


The overall picture

***IPCC WG 2 Fourth Assessment Report, April 2007:
Climate Change Impacts, adaptation and vulnerability***

Global warming will hit through water:

- ***Through climate change and the effects of e.g...***
 - ***changes in the hydrological cycle and water balance***
 - ***sea level rise***
 - ***increased water temperatures***
- ***Through increased climate variability in the form of more serious and frequent extremes, such as floods and droughts***



The overall picture

Some general trends:

Wet getting wetter – dry getting drier

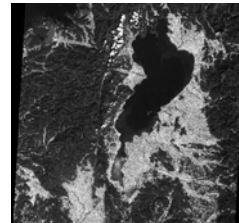
- ***plus 10-40% in wet regions (mostly North)***
- ***minus 10-30% in dry regions (mostly South)***

Changes in snow cover

-> 1/6 of World population experiencing lower run-off from major mountain ranges

Some geographical hot spots

- ***Africa South of Sahara***
- ***large coastal cities***
- ***mega deltas in Asia***
- ***small island states***



- hurting the poor in the poor regions!

The overall picture

The Mekong example (IPCC)

Basin flows (2038 / 2099)

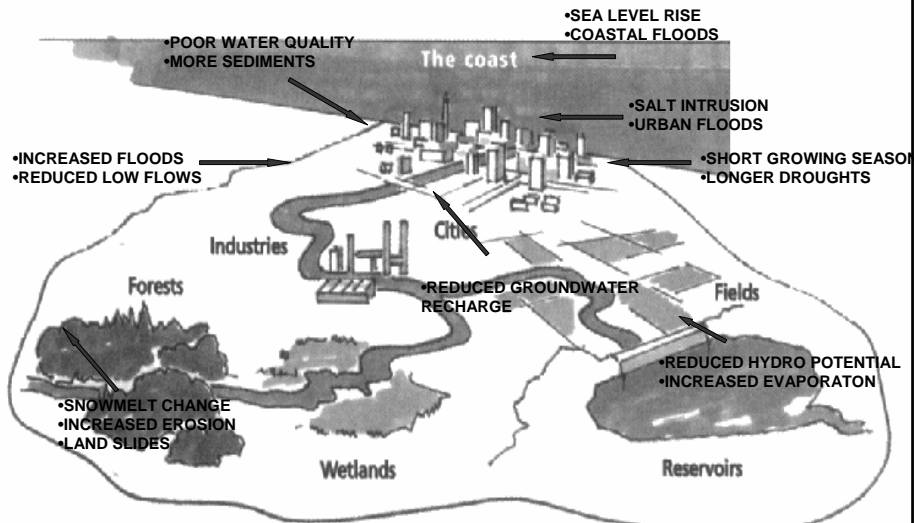
high flows +35% / 41%
low flows - 17% / 24%

Delta flows (2038 / 2099)

high flows +16% / 19%
low flows - 26% / 29%



Water and Climate Change in the South - in the river basin context



Integrated Water Resources Management being implemented

A message to take from the IPPC report

Energy is the focus for mitigation

Water must become focus of adaptation



Adaptation to climate change



Adaptation to CC

Different approaches and forms:

“Autonomous adaptation” :

Not deliberately designed to climate change, but lessening consequences, building resilience..

- e.g. demand management, reuse, rainwater harvesting ...

“Planned adaptation”:

Few examples yet ..

- e.g. design standards for sewers, dikes etc.

Adaptation to CC

Hard and soft solutions:

Hard solutions (infrastructure), such as...:

- dams (- storage to bridge the gap!!)
- dikes, levees, sewer networks, drainage canals
- desalination

Soft solutions, such as

- demand management, pricing!
- efficiency (ex. crop per drop), reuse
- salt- and drought resistant crops
- watershed management, artificial recharge
- flood proofing, flood retentions measures, insurance etc.

Adaptation to CC

Actors and scales

Actors

Public, private, civil society
=> a multi-stakeholder challenge

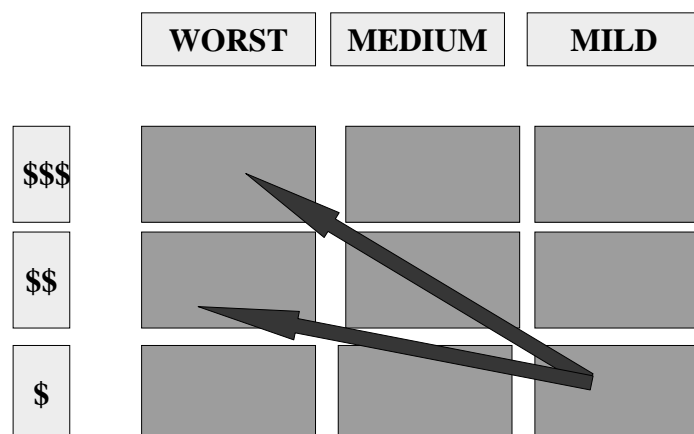


Scales

Community ↔ national ↔ regional ↔ global

=> A multi dimensional challenge

An adaptation (NAPA) framework



Uncertainty aspects of adaptation

The value of historical records..

- *hydrological business as usual relevant?*

From global and large-scale trends to local circumstances

- *large-scale figures do not translate to basin level*
 - > *need for down-scaling atmospheric models*
 - > *local modeling/assessment!*



=> Scenario-based approaches

- *but how to judge big differences?*

=> Adaptive management approach

- *building resilience/robustness to uncertainty*

Good water governance

Mainstreaming water in the political economy

Dealing with X-sectoral management

Focusing on demand management



Integrated Water Resources Management (IWRM)



Mainstreaming adaptation in IWRM

IRWM ↔ NAPA

Concluding on adaptation

Water must become focus of adaptation

Global trends cannot easily be translated to local facts; dealing intelligently with uncertainty is critical

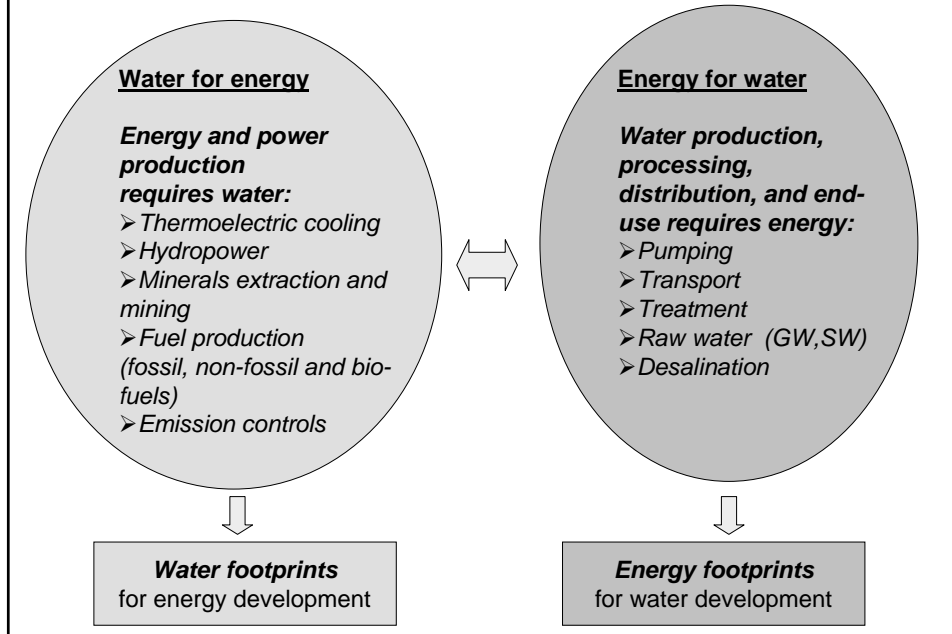
Improve today's management to address tomorrow's challenges: achieving the MDGs is already a challenge – climate change is an added dimension

The best approach towards achieving the MDGs and manage the impact of climate change on water is through IWRM

Adaptation and mitigation - the linkage through water



Energy and water development are inter-related



Energy – Water Linkages

Some US statistics:

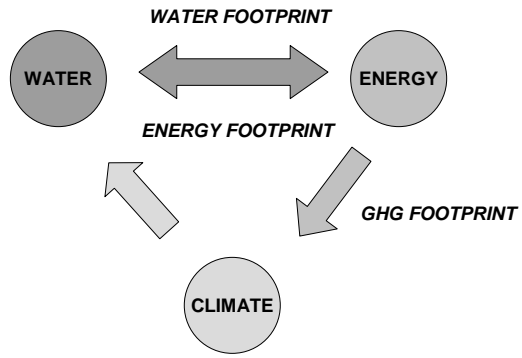
- over 40% water withdrawal for energy!

The US example:

“On average, in the United States two gallons of water are evaporated for every kilowatt-hour of electricity produced by hydroelectric and thermoelectric stations. In 2000, irrigated agriculture and thermoelectric generation withdrawals of freshwater were approximately equal. Electricity production requires about 136 billion gallons of freshwater per day, accounting for over 40% of all daily freshwater withdrawals in the nation”

(From invitation to Congressional briefing in 2006: “Understanding the Energy-Water-Climate Nexus: Implications for Policy”)

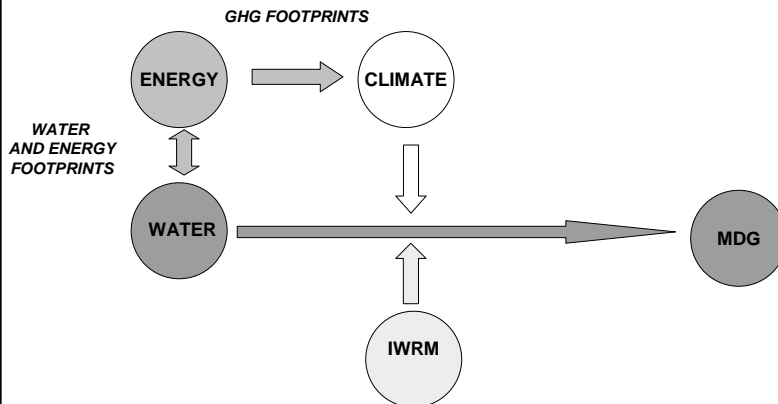
Water => energy => GHG footprints



- an inter-related system!

Completing the circle:

Water and energy linkages need to be considered as part of the picture



Concluding ...

Energy is the focus for mitigation

Water must become focus of adaptation

*- by improving today's management to
address tomorrow's problems and*

- by linking water and energy development



Thank you!