

A snapshot of the world‘s water quality: towards a full assessment

Joseph Alcamo
Center for Environmental Systems Research, University of Kassel, Germany

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UN WATER

There is major unfinished business in solving global water scarcity

Between 1990 & 2012

MDG Target 7C → Worldwide: + 2.3 billion people gain access to improved water supply.

But …

- 748 million people (2012) still rely on unsafe water sources
- Wastewater loadings increasing, but **not** wastewater treatment → River pollution is increasing. By how much?
- Is pollution reducing good water supply? A new scarcity?
- How to reach the Water SDG #6 ?

We need to uncover the water quality situation

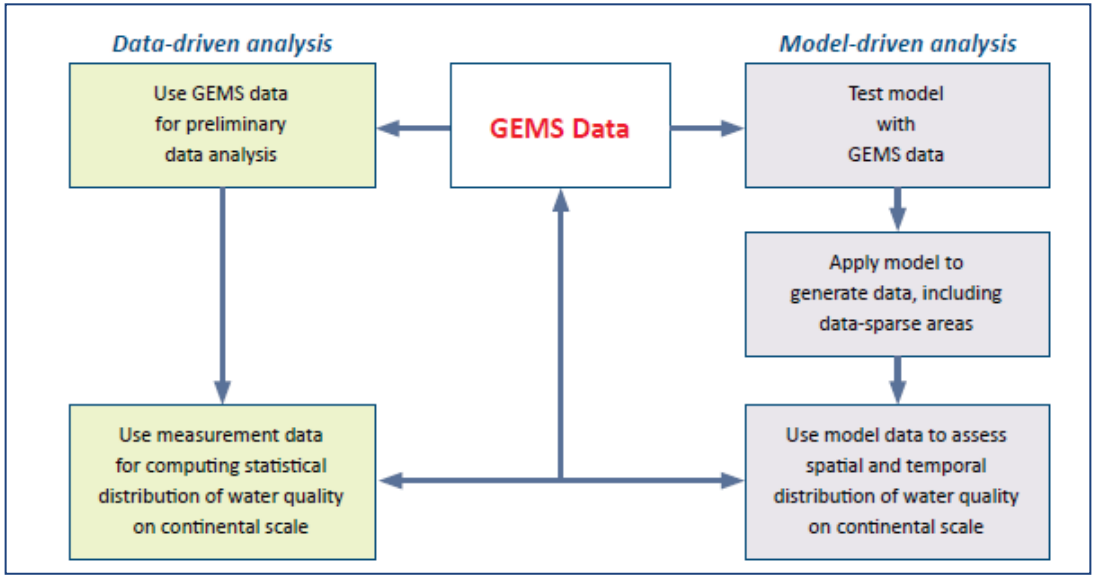
Last global water quality assessment : *UNEP/WHO „Global Freshwater Quality“* ***1989***

A new assessment: **UNEP/UN-Water „Pre-study“ → World Water Quality Assessment**

Combined approach: Data (GEMS/Water) + Modeling (WaterGAP) + Case Studies

International collaboration of 40 scientists from 10 countries, UFZ-Leipzig & Uni-Kassel

Focus on Latin America, Africa & Asia



Water quality (SDG #6) is closely linked to health (SDG #3)

Water quality & health link (SDGs 6 & 3)

Health risk → people come into contact with contaminated rivers & lakes → washing, cleaning, bathing

e.g. Zimbabwe rural survey: ~ 43% use rivers

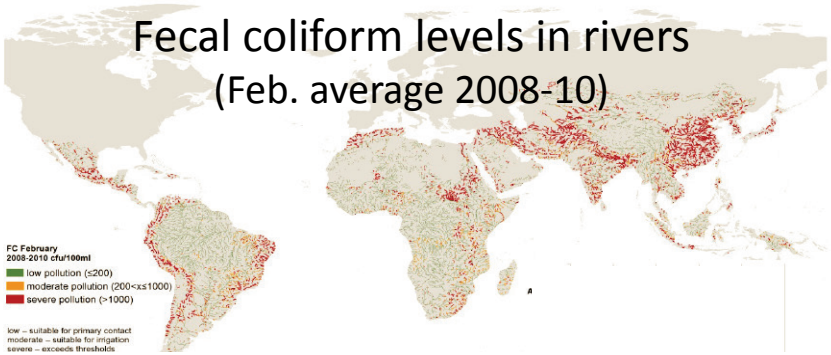
e.g. Survey in East Africa: 1/3 of people relying on surface waters suffer from intestinal sicknesses.

e.g. The frequency and duration of cholera outbreaks are associated with heavy rainfall and flooding (Zimbabwe 2008-9, 4000 deaths)

We can now estimate the extent of the threat of water pollution to health

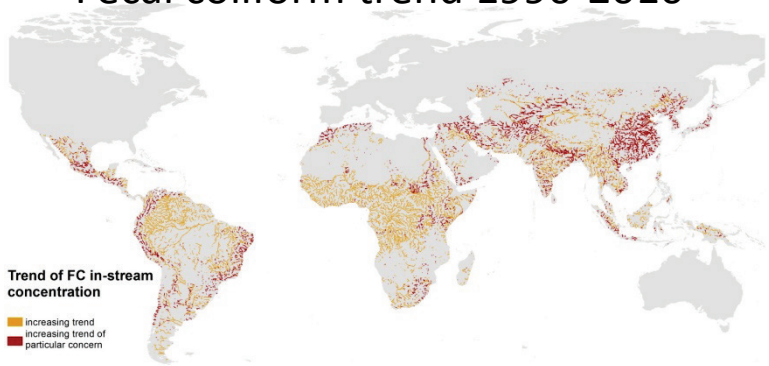
Health risks of contact with surface waters

Fecal coliform levels in rivers
(Feb. average 2008-10)



Source: UNEP. 2016. *A snapshot of the world's water quality: Towards a global assessment*

Fecal coliform trend 1990-2010



Source: UNEP. 2016. *A snapshot of the world's water quality: Towards a global assessment*

Latin America + Africa + Asia:
≈ 1/3rd total river kms with severe pathogen pollution

Total # people in contact with polluted surface waters
Latin America 8-25 M
Africa 32-164 M
Asia 31-134 M

≈ 64% total river kms with increasing pathogen pollution (1990-2010)

Main sources: unsafe sanitation practices & **sewered but untreated wastewater**

Scarcity of water for household needs?

Water quality (SDG #6) closely linked to food security (SDG # 2)

Crucial resource: The inland freshwater fishery

Link with food security (SDG # 2):

95% inland fishery production from developing world

200 million Africans consume fish regularly

Inland fishery: Substantial contribution to diet
e.g. > 40% of animal protein in Malawi, Bangladesh, Cambodia

Link with livelihood (SDG # 8):

Gross Market Value: Inland fisheries in tropics = $US 6 billion/yr

Livelihood: 60 M people worldwide in freshwater fishing industry

Link with freshwater biodiversity (SDGs # 6 , 15)

e.g. 21% freshwater fish species in Africa threatened (IUCN, 2010)

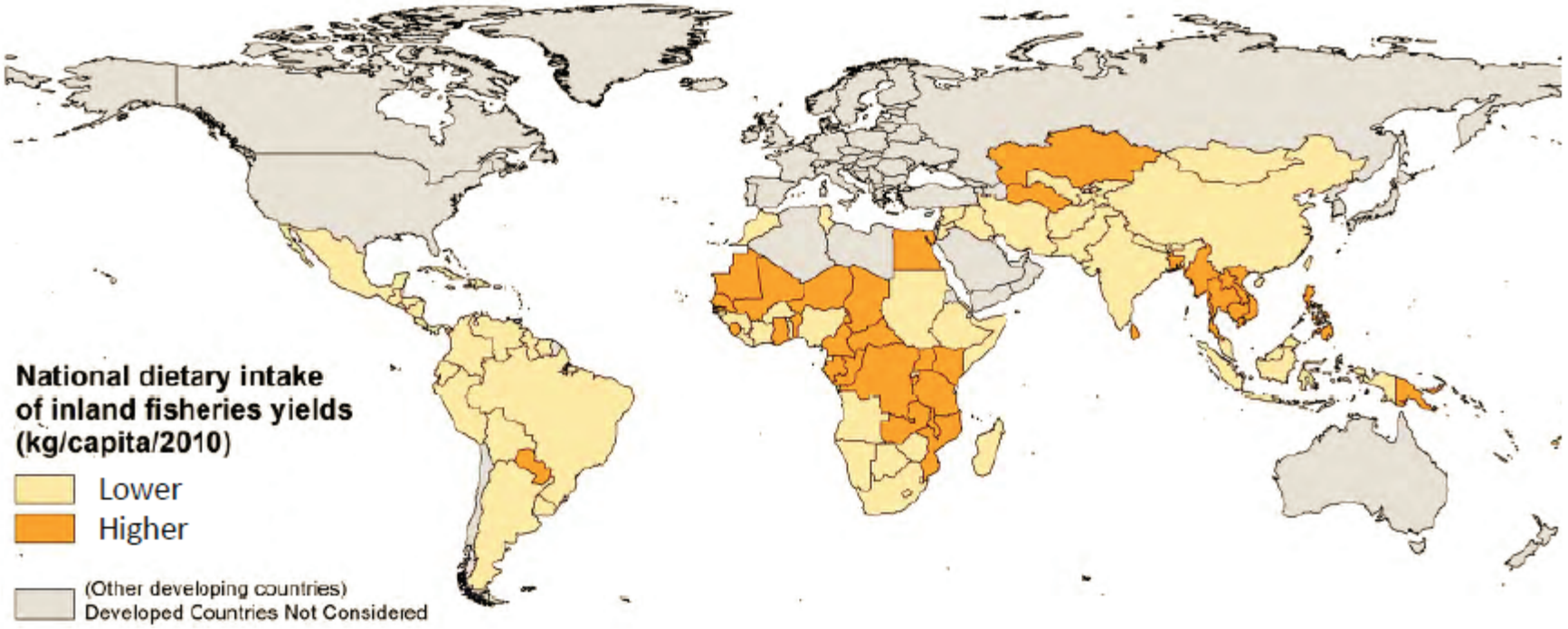
Water pollution reduces fish habitat

Vulnerabilty to water pollution threats to inland fishery

Description :- Estimation of the level of consumption of inland fisheries per person per country.

Method :- Reported inland fisheries catch (t) divided by the official national population.

Categorisation :- Higher consumption: ≥ 1,86 kg/capita/2010 and
Lower consumption: < 1,86 kg/capita/2010
(75th percentile of countries reporting inland fisheries yields)



We can now estimate the size of the threat of water pollution to food security

Organic pollution

Threat to fish & aquatic ecosystems

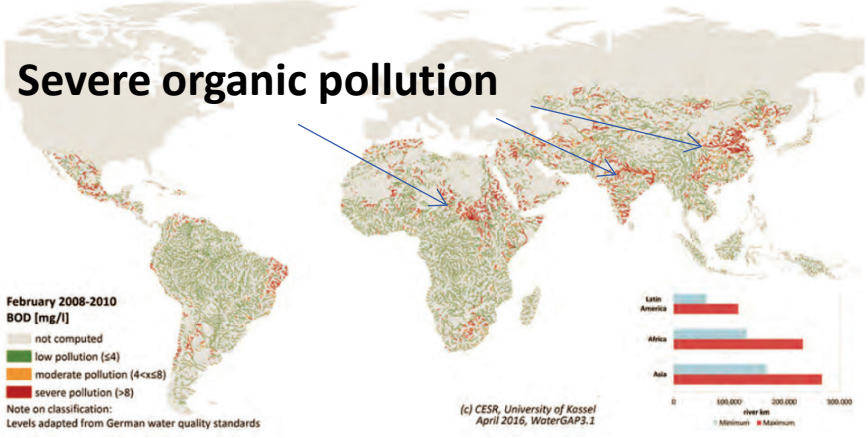
Low dissolved oxygen, high levels ammonia, other pollutants

Main sources: Sewered but untreated wastewater from households & manufacturing

≈ 1/7th all river km's with severe organic pollution

≈ 63% of all river km's with increasing org pollution (1990-2010)

Scarcity of habitat for fish?



Source: UNEP. 2016. *A snapshot of the world's water quality: Towards a global assessment*

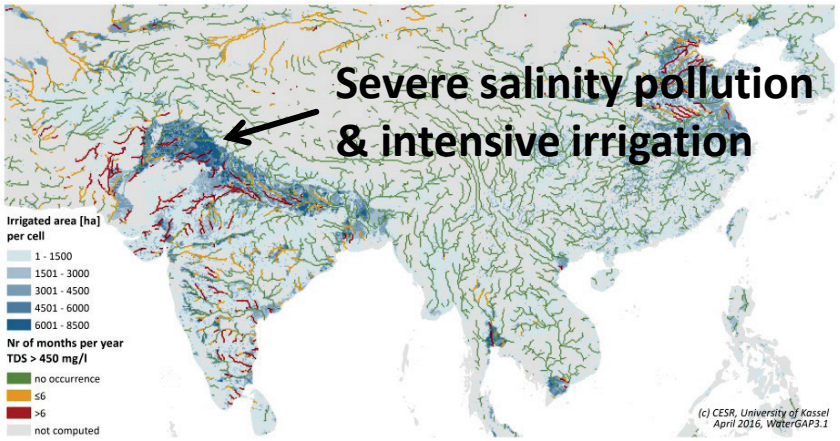
Salinity pollution

Constrains water use for irrigation & other purposes

≈ 1/10th of all river km's moderate & severe salinity pollution

≈ 31% of all river km's with increasing salinity pollution (1990-2010)

Scarcity of suitable water for irrigation?



Source: Floerke, Alcamo, et al. 2016.

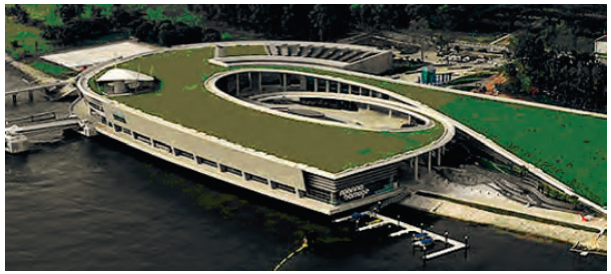
Finding solutions

Although water pollution serious and getting worse, most stretches of rivers in Latin America + Africa + Asia still in good condition

Many good options to prevent increasing pollution and restore polluted waters

- ✓ Technical options: e.g. Ecosystem-based approaches to reducing water pollution
- ✓ Management options: e.g. Extending integrated water resources management
- ✓ Pollution prevention …
- ✓ Other …

Constructed wetlands



Safe reuse of wastewater

Rehabilitating wetlands as filters for pollutants

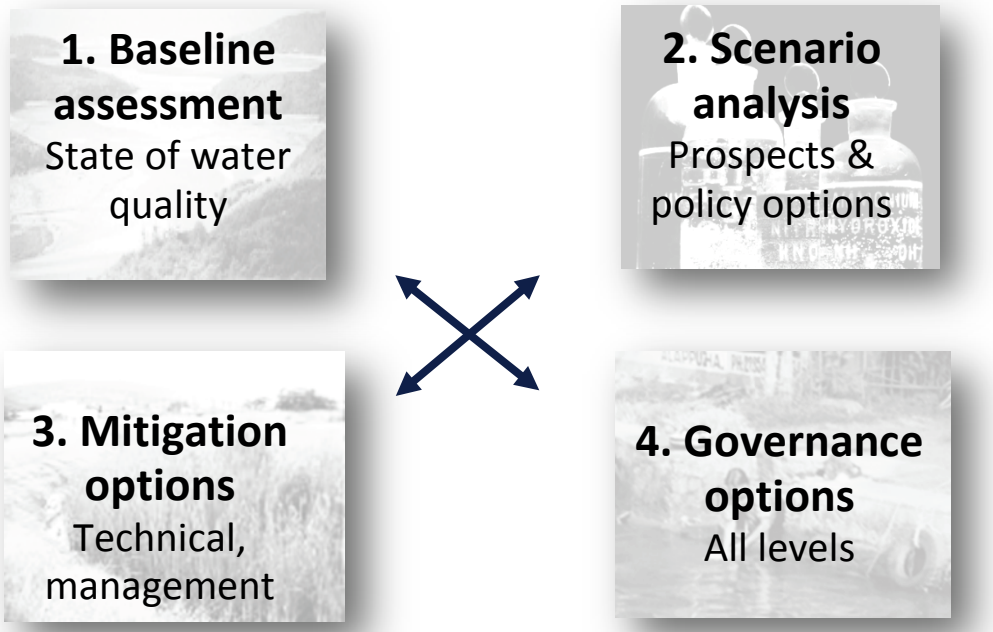
Community-based ecological sanitation

Next?

- ✓ Where are the hot spots? What are the trends? (climate change, …)
- ✓ What about the „other“ pollutants? (pharmaceuticals, micro-plastics, nutrients, …)
- ✓ Which solutions will work best where?

UNEP/UN-Water pre-study for a worldwide assessment → **Full assessment**

Close the data gap
- Strengthen GEMS database/UNEP Live
- Field studies (citizen science)
- Remote sensing
- Modelling



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Confront the global water quality challenge

Serious and increasing water pollution Latin America, Africa, and Asia

Water pollution is the new water scarcity

Need to act under the SDG-Agenda:

- ✓ **Monitoring** → better understanding
- ✓ **Assessment** → priority-setting
- ✓ **Technical & management measures** → addressing the cause
- ✓ **Effective institutions** → getting it done

Google: "UNEP snapshot water quality"

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