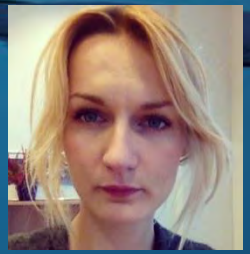
UNEP-DHI Water Quality Webinar Series

WQ Webinar #3

Frameworks for Water Quality Governance

Facilitator: Gareth James Lloyd

Technical Support: Maija Bertule



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www.unepdhi.org

October 14th, 2015

Contents

1. **Jan Hassing (DHI):** *Developing and applying water quality governance frameworks*

2. **Lisbeth Flindt Jørgensen (GEUS):** *Key issues with groundwater and quality*

3. **Miriam Feilberg (DANVA):** *How to improve public awareness and engagement*

4. **Concluding questions from audience**

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Water quality Governance framework

Name and background: Jan Hassing
Water Resources Engineer
Title: Senior Policy Adviser
Bio: Policies and Strategies, Water Resources Management, Water Quality and IWRM


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Water needs a governance framework
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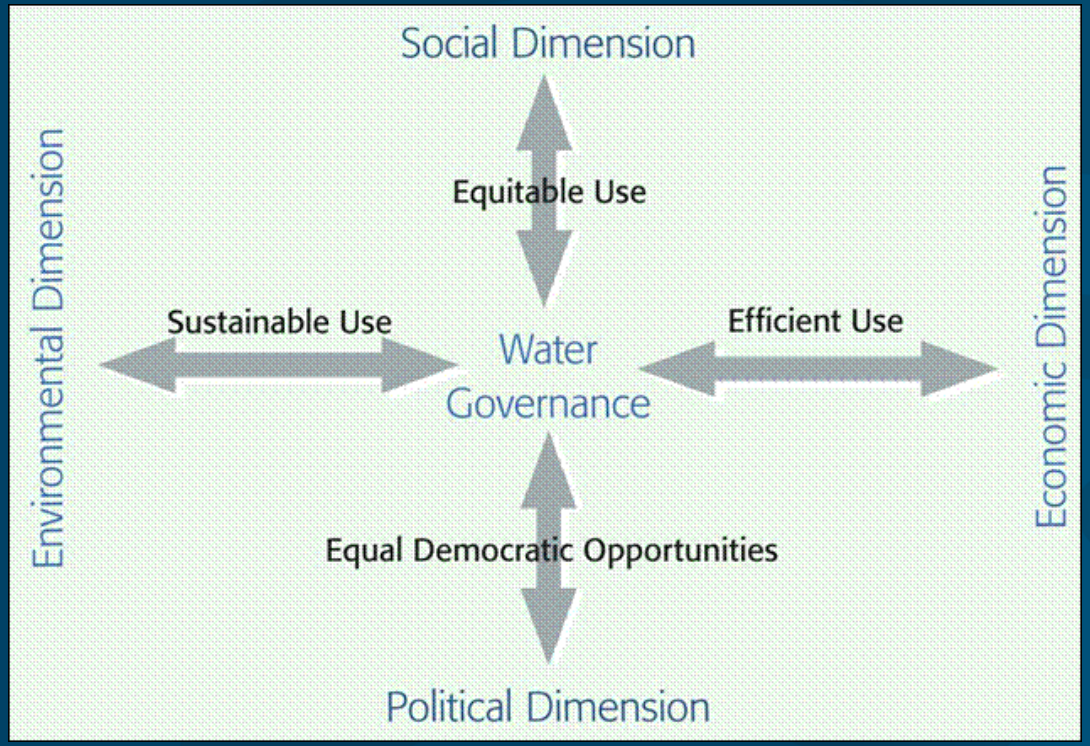
Water governance dimensions



Examples of the economic importance of water quality in relation to irrigated agriculture

- High salt contents in irrigation water
- Approx 7300 km2 becomes unsuitable for production per year
- Today 20% of the world's irrigated lands are affected (an area equal to the area of France)
- The global cost of crop losses due to salt content comes toUSD 27 billion/year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Social dimensions of poor water quality
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Examples of the social importance of water quality in relation to drinking water

- 2.2 million people die prematurely each year due to unsafe water quality (e.g. bacterial contamination)
- Healthy life years lost amounts to 73 million/year
- This means,
  - heavy burdens on community health services,
  - reduced productivity,
  - loss of skilled workers,
  - loss of livelihoods,

Concepts of a management framework
Integrated Water Resources Management

“IWRM is a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems”

(Global Water Partnership,Technical Committee).

Framework for co-management of water quantity and quality

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A. Enabling environment
A1. Policies
A2. Legislation
A3. Financing & incentive structures

B. Institutional roles
B1. Creating an organizational framework
B2. Institutional capacity blg

C. Management instruments
C1. Natural resources assessment
C2. Plans for IWRM and ICZM
C3. Demand management
C4. Social change instruments
C5. Conflict resolution
C6. Regulatory instruments
C7. Economic instruments
C8. Information management

Developing a comprehensive water policy and strategy integrating quantity and quality management

- **Examples of guiding principles for policy and strategy development**
  - Prevent pollution rather than treating the symptoms
  - Use the precautionary principle
  - Apply the polluter-pays-principle
  - Apply realistic standards and regulations
  - Balance economic and regulatory instruments
  - Water quality management at the lowest appropriate level
  - Use the basin as the water quality management unit


North Sea
ENGLAND
NETHERLANDS
Rotterdam
POLAND
Duisburg
Düsseldorf
Cologne
GERMANY
BELGIUM
English Channel
Bonn
Rhine River
Mosel
Main
Mainz
Bingen
CZECH REPUBLIC
LUXEMBOURG
Mannheim
Heidelberg
Neckar
Danube
Strasbourg
VOSGES MOUNTAINS
BLACK FOREST
Schaffhausen
Lake Constance
AUSTRIA
FRANCE
Zürich
Basel
LIECHTENSTEIN
Aare
SWITZERLAND
Andermatt
Chur
ALPS
SLOVENIA
ITALY
CROATIA
100
km
mi

The Sandoz Chemical spill (1986)
River Rhine – worst pollution in decades

- Fire in an agrochemical warehouse near Basel
- 30 tons of agricultural chemicals was washed into the Rhine, a 70 km red toxic trail moved through 4 countries
- Switzerland notified the downstream states 24 hrs after the spill
- Rhine was closed as a drinking water source for 18 days – all fish life was wiped out
- Damage payments of 42 mill Swiss francs were made and Sandoz set up a Rhine Fund to support projects on Rhine's ecosystem

The Sandoz Chemical spill (1986)
River Rhine – Responsibility issues and new regulations

- States are not responsible for the conduct of its nationals
- States are responsible for its institutions, which could have, but did not, prevent damages caused by a private person
- New regulation in Switzerland on ”Fire protection for stocks of hazardous materials” and a central chemical database in National Alarm Centre
- New international regulations and setting up a ”Rhine Alarm” system – EU Directive on ”Control of Major Accident Hazards involving Dangerous Substances” (Seveso Directive)

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Lessons learned

Key lessons - Worldwide

- Water pollution management is only really meaningful and effective when it is organized within an ***IWRM framework*** , where the interdependent *water quantity* and ***water quality*** are included on an ***equal basis*** and where ***cross-sectoral coordination*** is a critical requirement

Key lessons

The steps towards a strategic water pollution management framework include:

- Identification of water quality issues
- Analysis of present institutional capacity and capability
- Categorization of water quality issues
- Prioritization of water quality issues
- Identification of required management interventions
- Identification of long term and realistic short term objectives

Key lessons

- Management tools to control pollution include:
  - Regulations, by-laws and guides
  - Water quality objectives and emission standards
  - Economic instruments
  - Monitoring systems
  - Water quality modelling – prediction of impacts
  - Environmental impact assessments

Thank you

Jan Hassing

Groundwater and quality issues

Name: Lisbeth Flindt Jørgensen, Geological Survey of Denmark and Greenland

Title: Senior Geologist

Bio: Experienced groundwater manager. Has worked with groundwater at local, regional and national scale in research context as well as in administrative aspects at responsible authorities.

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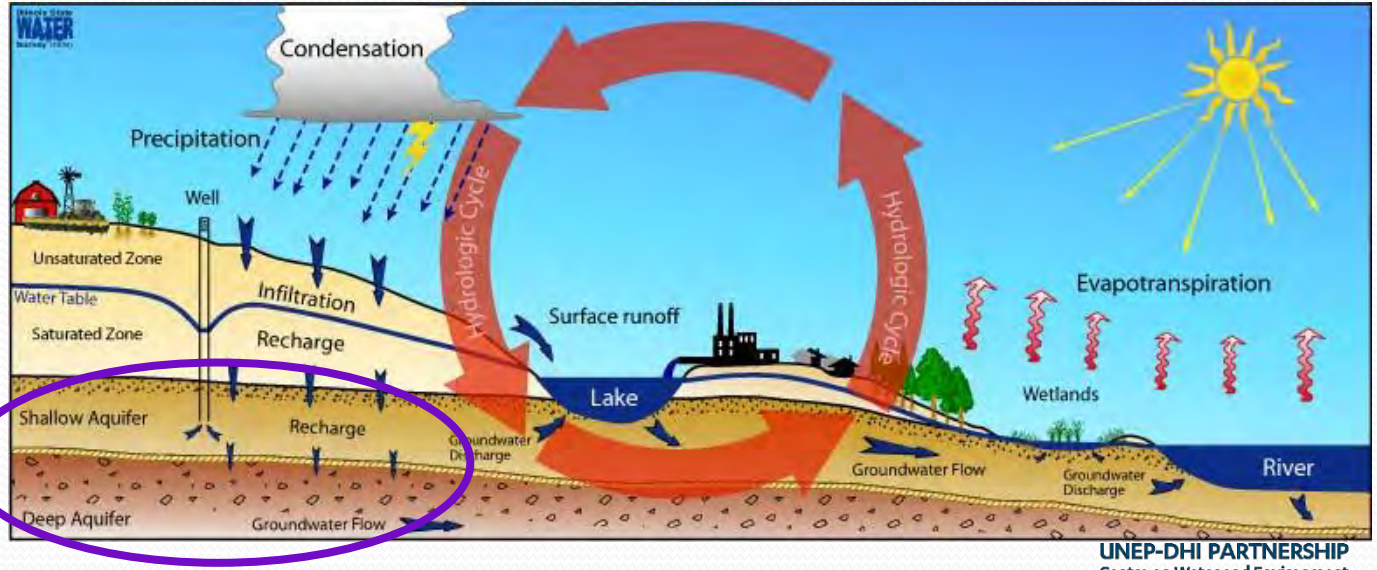
Definition of groundwater



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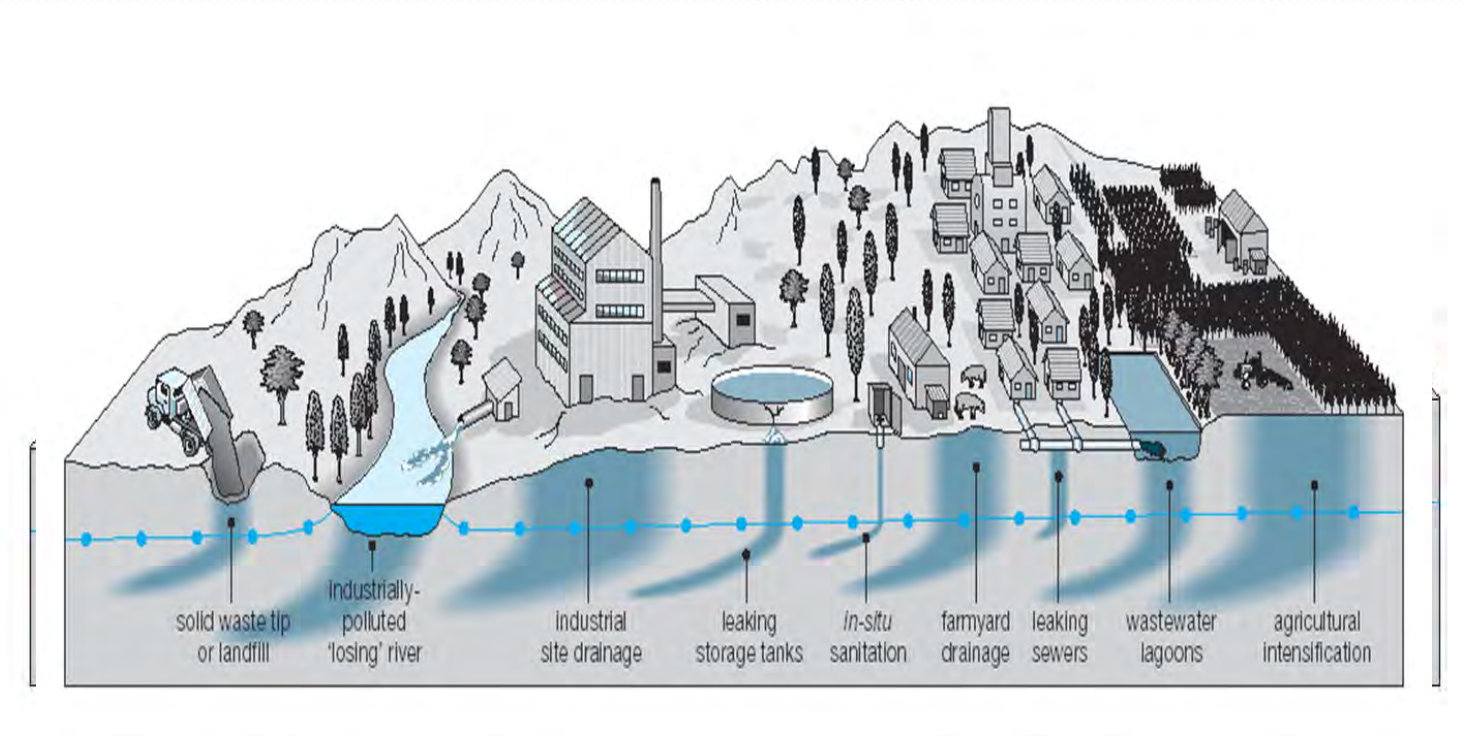
Cortesy by Illinois State Water Survey

What is groundwater contamination?

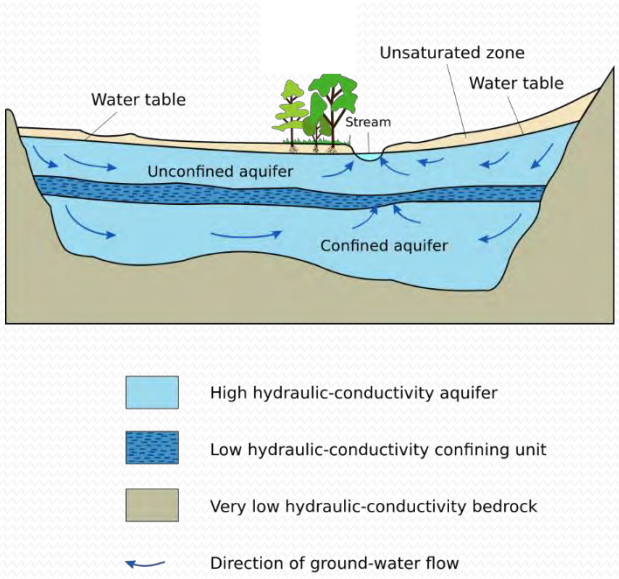
- Definition and perception may vary
- Often a hidden problem
- Bad quality not always contamination
- **Unwanted (identified) anthropogenic substances in unacceptable concentrations**

What can harm groundwater quality?



Groundwater contamination – what should we consider?

- Hydrogeology

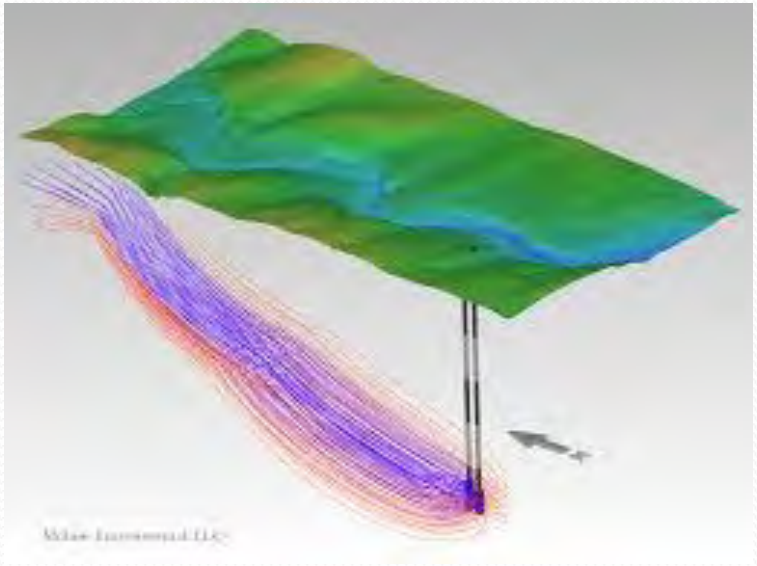


Groundwater contamination – what should we consider?

- Hydrogeology
- Geochemistry

Groundwater contamination – what should we consider?

- Hydrogeology
- Geochemistry
- Solute transport processes



Groundwater contamination – what should we consider?

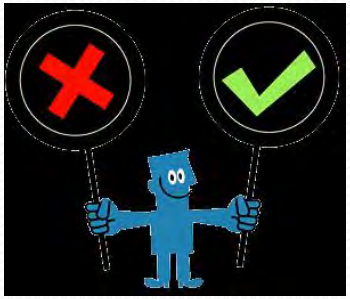
- Hydrogeology
- Geochemistry
- Solute transport processes
- Natural degradation processes

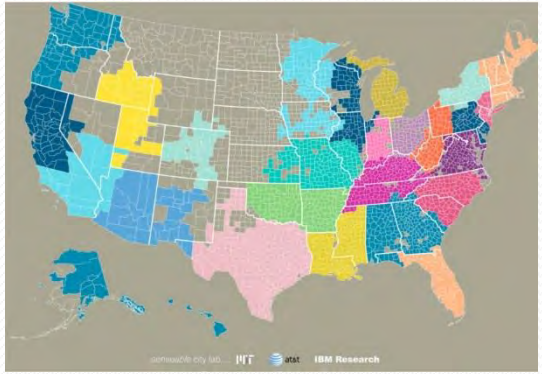
How can we protect groundwater?

- More levels – local, regional, national and international.
- Local:
  - Wise water use
  - Waste water ≠ clean drinking water
  - Close abandoned wells
  - Handling of hazardous substances
  - Waste disposal

How can we protect groundwater?

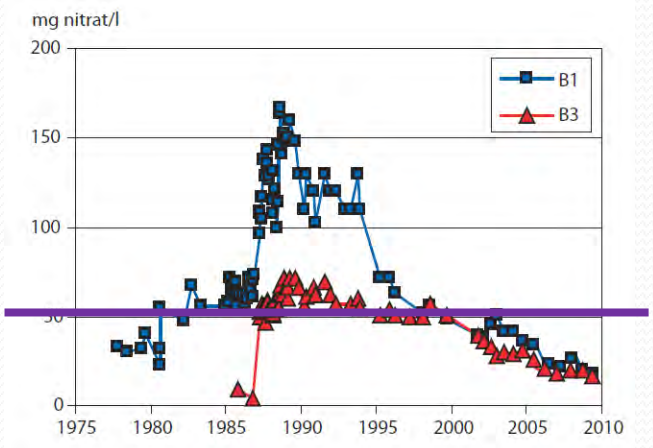
- Regional, national and international.
  - Groundwater ≠ administrative boarder
  - Common efforts and shared strategy
  - Legal framework
  - Enforcement



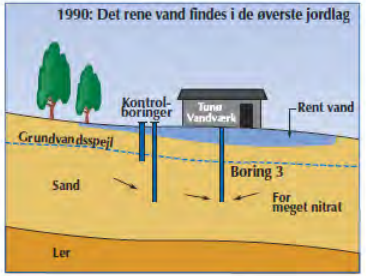


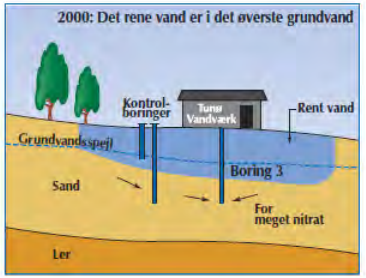
An example – Denmark

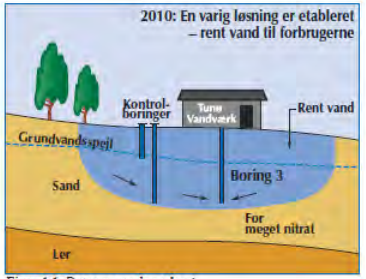
- Small island (Tunø)
- Nitrate content in two abstraction wells for drinking water supply
- Volunteer agreement with farmers
- 20 years – better quality



Courtesy by Odder Kommune 2012







Figur 1.1 Det rene vand er på vej.

Groundwater as drinking water resource ?

- Where available usually a good alternative or supplement to surface water sources for most purposes
- Quality issues – as with surface water!
- Soils – degradation capacity – to some extent!
- Might be more clean than surface water - more safe and cheaper to use
- Measures to secure the quality is necessary!

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Awareness and public participation

Name: Miriam Feilberg

Title: Senior Advisor, DANVA

Bio: Water policy governance, awareness and public participation, knowledge sharing

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A participatory approach

IWRM Principles

Share:

IWRM strategies are based on the four Dublin Principles presented at the World Summit in Rio de Janeiro in 1992.

1. Water is finite and vulnerable resource

Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.

Read "1. Water is finite and vulnerable resource"

2. Participatory approach

Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.

Read "2. Participatory approach"

3. Role of women

Women play a central part in the provision, management and safeguarding of water.

Read "3. Role of women"

4. Social and economic value of water

Water is a public good and has a social and economic value in all its competing uses.

Read "4. Social and economic value of water"

5. Integrating three Es

Integrated water resources management is based on the equitable and efficient management and sustainable use of water.

Read "5. Integrating three Es"

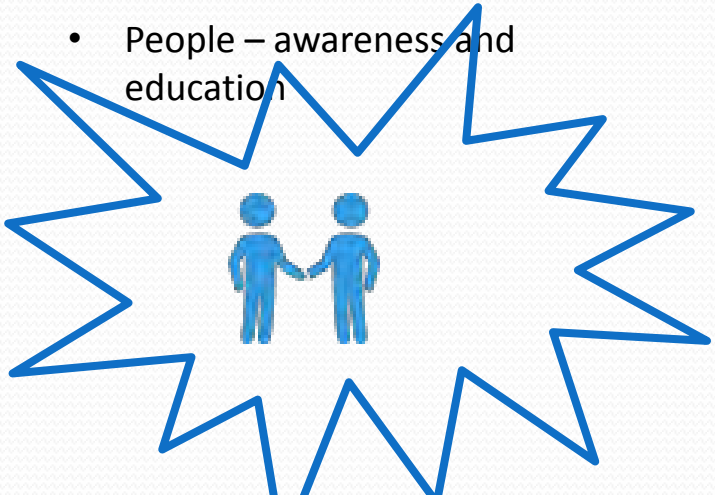
Many factors behind sound water management
The Danish case of declining water consumption

- Regulatory Framework

- Technology

- Price and revenue collection system in place

- People – awareness and education

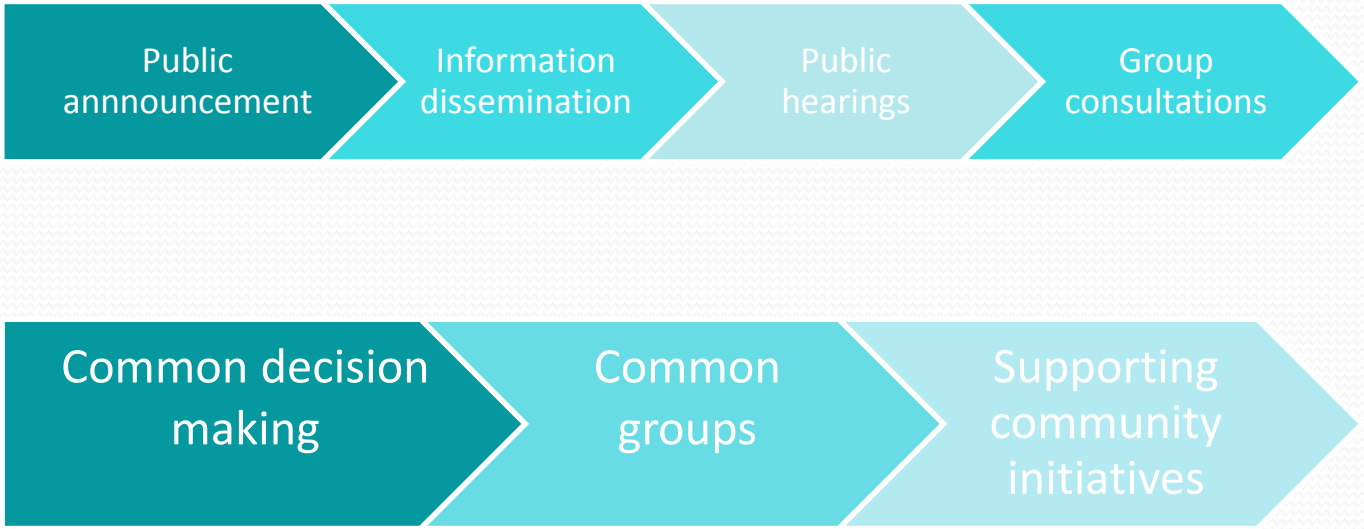


We all need to understand

But different mechanisms to make us do so:

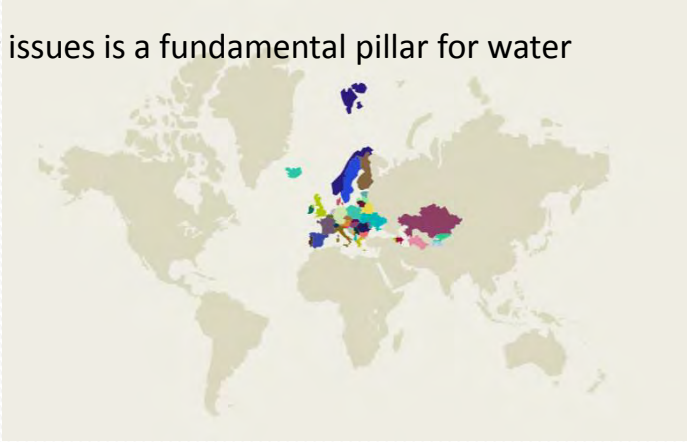
- Zambia – Water SAG
- Basin organisations – multi-stakeholder
- Facilitate organisations like WUA's – vulnerable groups
- Use existing organisations like property owners organisations

Stages of participation

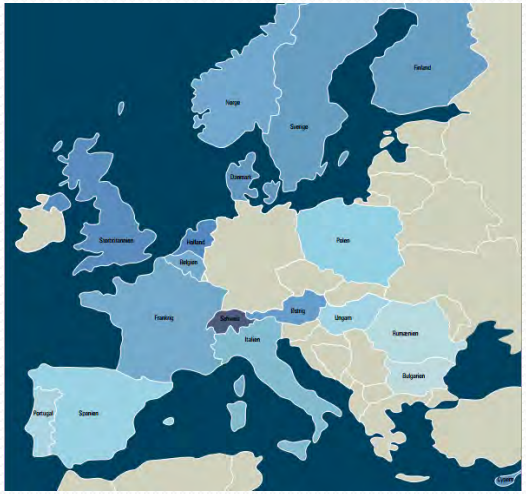


Legal Framework - EU Water Framework Directive on Citizens involvement

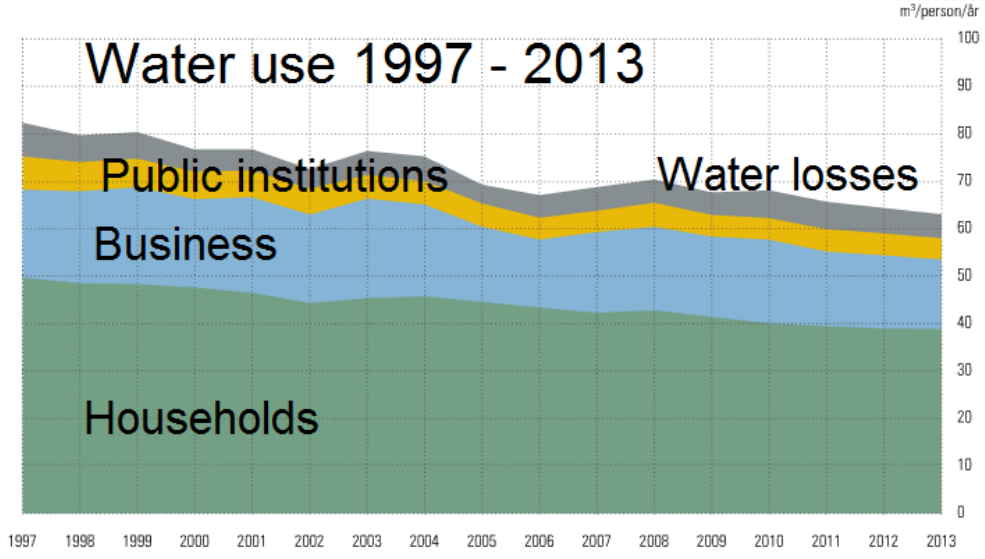
- Article 14 - EU implementation of Aarhus Convention: Access to information, public participation and to complain
- WFD calls for active involvement of interested parties
- In Europe active involvement in many cases has led to better understanding of needs to save water and pay for it and to better results
- Awareness and understanding water issues is a fundamental pillar for water saving in Denmark



Public acceptance of high water prices in Europe due to awareness and inclusion



Steady decline in Danish water consumption



Implementation of water saving and improving water management

High level of environmental awareness

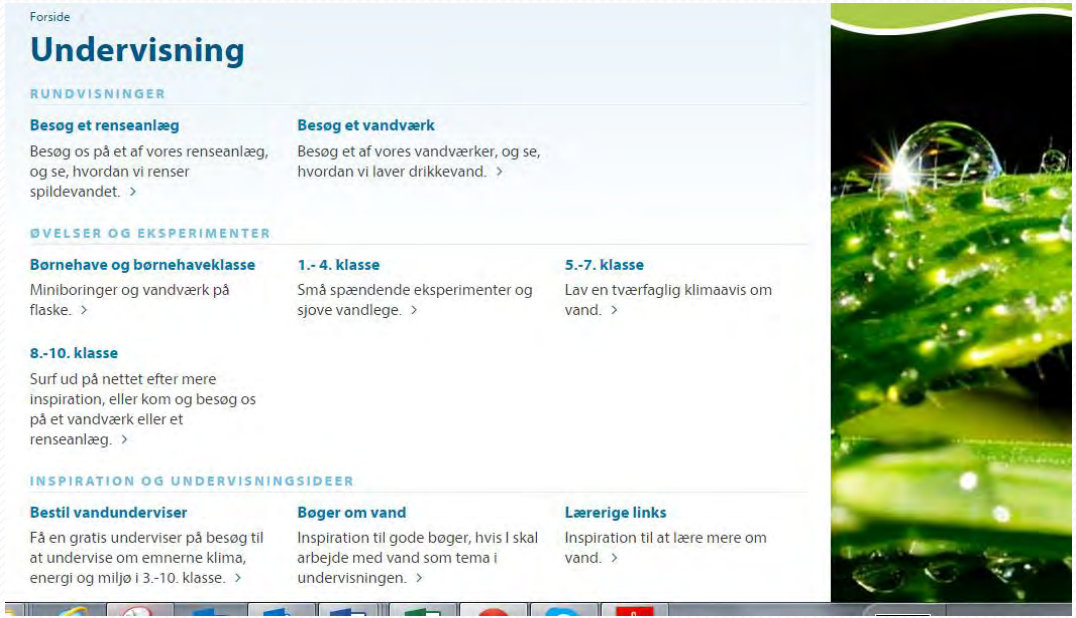
High level of water awareness

Up to 40% of results in water savings may be due to awareness

Is this also the case in in the countries you are coming from?

Understanding of price mehanism – example from Bangladesh

Opportunities for schools to participate



Forside

Undervisning

RUNDVISNINGER

Besøg et renseanlæg

Besøg os på et af vores renseanlæg, og se, hvordan vi renser spildevandet. ›

Besøg et vandværk

Besøg et af vores vandværker, og se, hvordan vi laver drikkevand. ›

ØVELSER OG EKSPERIMENTER

Børnehave og børnehaveklasse

Miniboringer og vandværk på flaske. ›

1.- 4. klasse

Små spændende eksperimenter og sjove vandlege. ›

5.-7. klasse

Lav en tværfaglig klimaavis om vand. ›

8.-10. klasse

Surf ud på nettet efter mere inspiration, eller kom og besøg os på et vandværk eller et renseanlæg. ›

INSPIRATION OG UNDERVISNINGSIDEER

Bestil vandunderviser

Få en gratis underviser på besøg til at undervise om emnerne klima, energi og miljø i 3.-10. klasse. ›

Bøger om vand

Inspiration til gode bøger, hvis I skal arbejde med vand som tema i undervisningen. ›

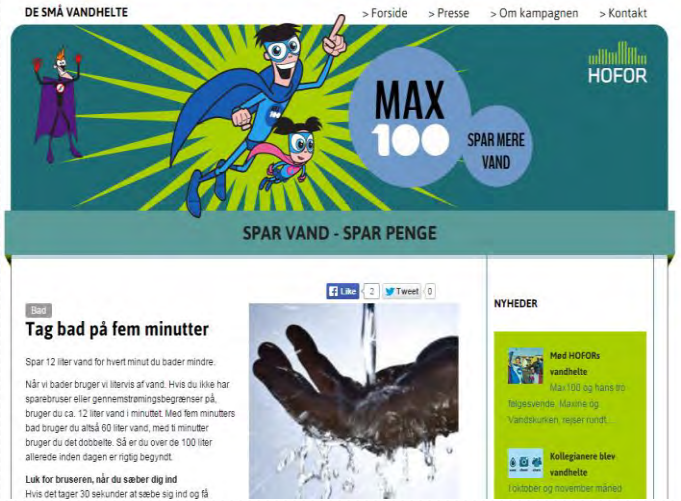
Lærerige links

Inspiration til at lære mere om vand. ›

Environmental eduction in schools

www.vandetsvej.dk

Widespread information to communities
An example – reduce water for showers



Targeting information for public institutions – 7% water volume

- A Danish study shows that it is good common sense and healthy economy to focus at water consumption. There can be easy money to save.
- Industry and municipalities estimate the savings potential in public institutions at approximately 10-15%.
- If this is realized the institutions will save approximately 290.000 m3 water, equal to a yearly saving of 13 mio. DKK.
- Information to institutions on gains from changing toilets and installing leakage alarms
- Incentives are important

Climate change adaptation

- Involvement of communities leading to better solutions and to saving water, energy and costs
- Example from Odense where communities proposed to tear down houses to make room for lake to be used for storm water
- Example from Middelfart, where communities take very actively part in discussing solutions for local climate change adaptation and for instance methods to improve local infiltration of rain water – cost saving for treatment plants
- And Copenhagen where awareness is integrated into climate change adaptation and cloud burst management plans

Thank you for your participation today

You are welcome to:

- Write for more information: mfe@danva.dk
- Find more information on Danish experiences on www.stateofgreen.com or www.rethinkwater.dk
- More on global experiences here: www.gwp.org and in the GWP Toolbox

Additional Questions

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Thank you for attending WQ Webinar #3

- Questions/comments to Maija Bertule mabe@dhigroup.com
- Webinar recording and slides on YouTube (UNEP-DHI) and http://www.unepdhi.org/wq-webinars
- Link to recording and Feedback survey in follow-up email

Next webinar (#4)

- October 28th: **"Water Quality Interventions"**
- Registration: https://attendee.gotowebinar.com/register/4959954497244173058

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