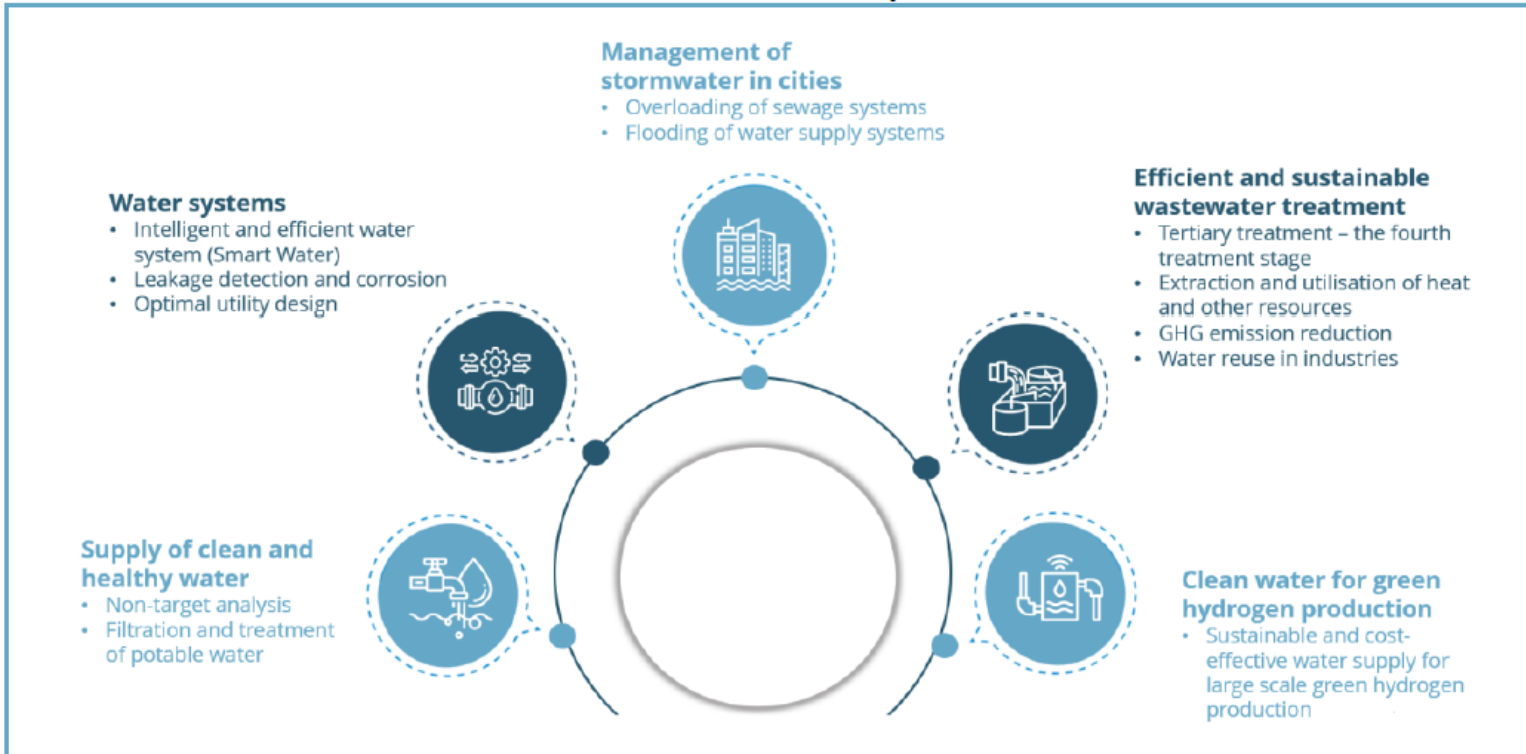


# Critical infrastructure and Danish research – is there a match?

**Peter Steen Mikkelsen**  
**Professor, Urban Water Systems**  
**DTU Sustain**  
**Water Systems Section**  
**Technical University of Denmark**

## Five focal areas for future water tech research and development



Source: IRIS Group



# DTU Sector Development Report (2019)

Presented in Danish Parliament, 25th March, 2019

“Kick-start the **blue transformation**, through increased focus on research, innovation, education and entrepreneurship, to make the sector **more efficient, more innovative, less fragmented and more sustainable**” !



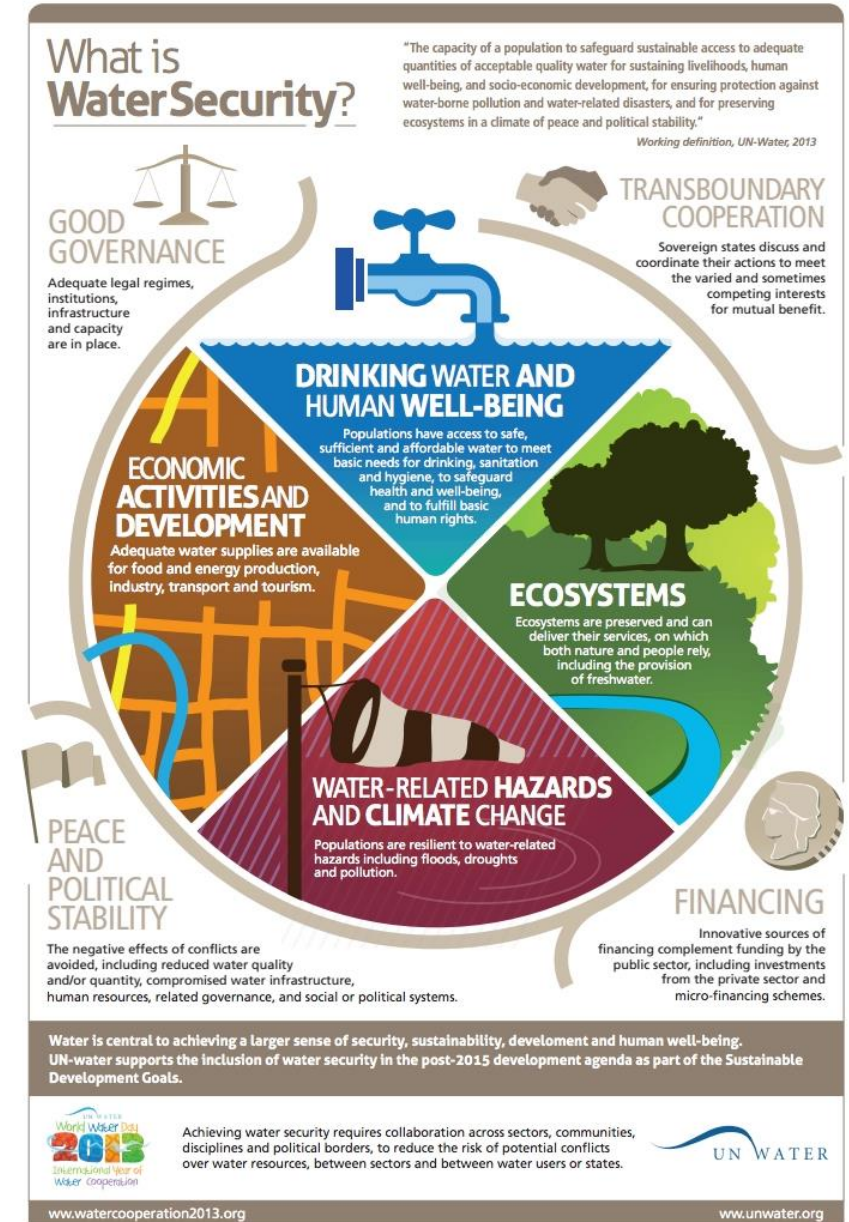
# What is "Water security"?

UN Water (2013):

*The capacity of a population to safeguard sustainable access to adequate quantities of 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.*

**Water security =? Vandsikkerhed**

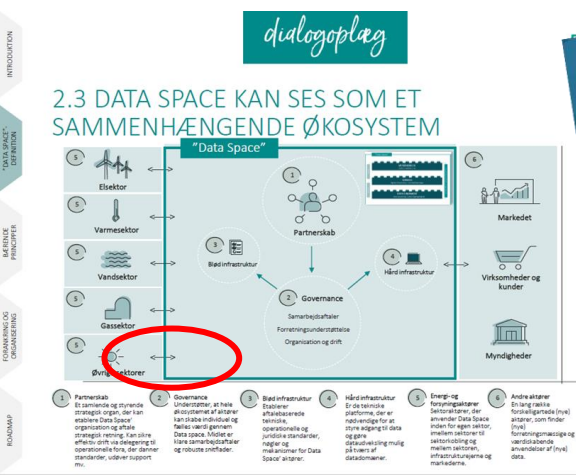
**Technology for water security =?  
Vandsikkerhedsteknologi**



# Examples of relevant research framings within Water security = "Vandsikkerhedsteknologi"

- **Climate adaptation, infrastructure and water resources** - in the city, on the coast and in the countryside. Technology for the planning, design and operation of solutions for multifunctional land use with a view to resisting the negative effects of extreme weather, while at the same time reducing the stress on the aquatic environment and the release of greenhouse gases. The starting point can e.g. be managing rain in cities, coastal protection during storm surges, water consumption in connection with PtX energy solutions, and the water environment in the open land and on the coast.
- **Effective, holistic and sustainable management of the water sector through digitalisation.** Sensor technology, satellite data and alternative data sources as well as digital twins and artificial intelligence to quantify and manage current unknown flow paths of water, pollutants, energy and resources across the water cycle in nature and the technosphere - in terms of drinking water supply, drainage of rain and high ground water, circular wastewater treatment, and industrial water consumption.
- **Fit-for-purpose circular water technology** – synergy between health, environment, climate, energy and food. Advanced materials, processes and components for use in physical-chemical-biological water treatment to meet future needs in the treatment and extraction of resources from a diverse range of water sources (groundwater, wastewater, rain, gray wastewater, drainage of high groundwater), which will gain increased importance in the future and already has it internationally.

# Water data spaces: An EU concept we can't ignore!



June 2022



Jan 2023



Oct 2023



- Case-based SME innovation processes
- Prototype of data sharing IT-architecture
- Alexandra participates this time, they already do similar for energy data
- *DHI and DTU Sustain both participate again*
- So do Miljøportalen, and others

Apr 2024



Spring 2024 DTU Sustain



2022-2025 No DK-participation...

*What's the next step from a Danish water sector perspective?*