



Inter-Parliamentary Union
For democracy. For everyone.



19th Rencontres du Vietnam

Innovation in water technology for water security, In the context of the SDG 6

Florian Thevenon
ICISE conference center
Quy Nhon, Vietnam
12th September 2023

Sustainable Development Goals

for people, planet, prosperity, peace and partnership



“The interlinkages and integrated nature of the Sustainable Development are of crucial importance in ensuring that the purpose of the new Agenda is

Millennium Development Goals (MDGs) vs. Sustainable Development Goals (SDGs)

MDGs

- UN-led
- 8 goals and 21 targets, focusing on poverty reduction
- Relevant to low income countries
- 2 water and sanitation targets under MDG 7
- 3 core indicators on water and sanitation
- Monitoring through household surveys

SDGs

- Country-led
- 17 goals and 169 targets, focusing on the three pillars of sustainable development
- Relevant to all countries
- 8 water and sanitation targets under SDG 6
- 12 core indicators on water and sanitation
- Monitoring by national authorities, feeding into regional and global reporting

SDG 6 and its 8 targets

“Ensure availability and sustainable management of water and sanitation for all”

6.4
Water use
and
scarcity

6.5
Water
manage-
ment

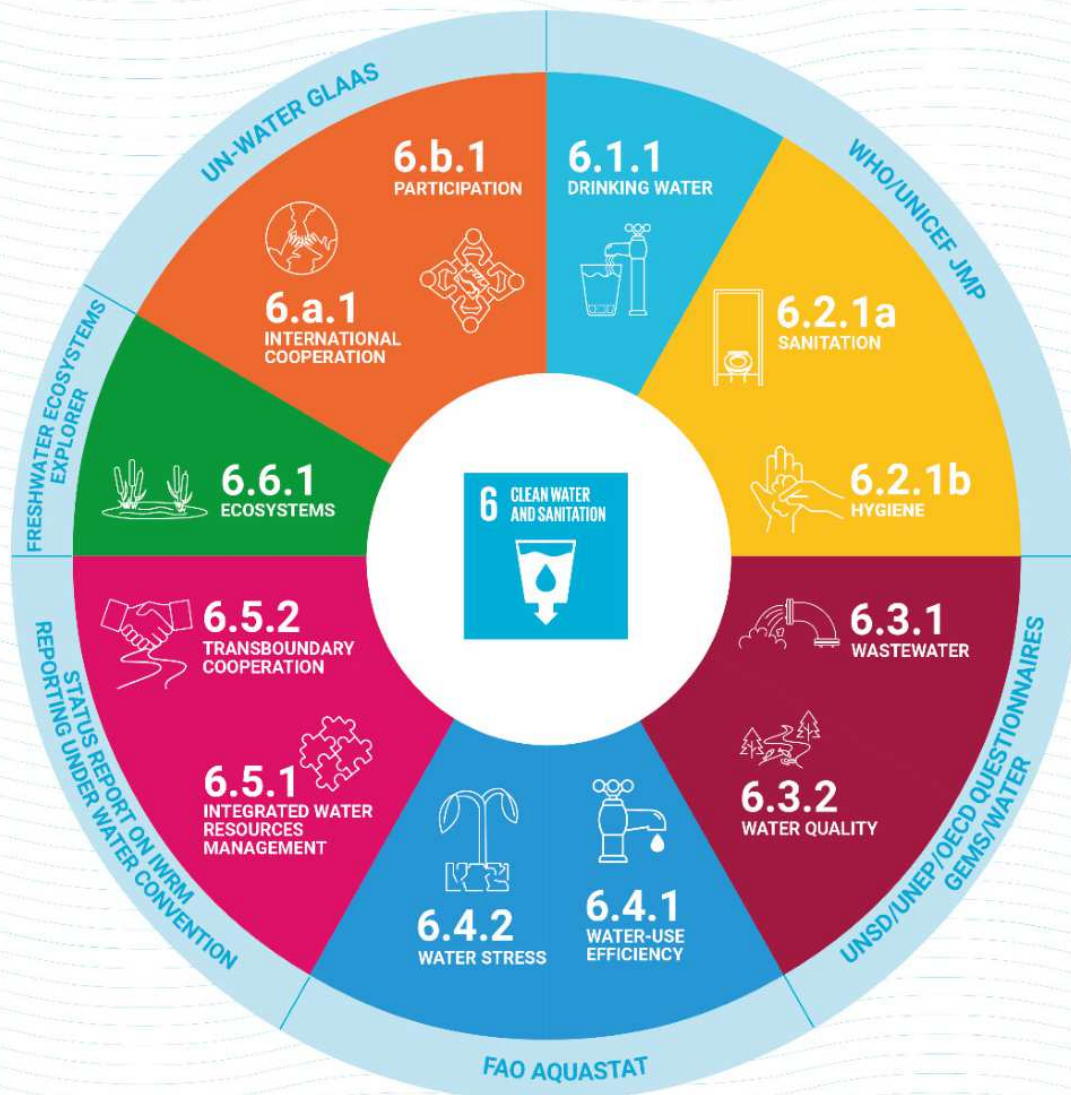
6.6
Eco-
systems

6.a and 6.b
Cooperation
and
participation

6.3
Waste-
water and
water
quality

6.1
Drinking
water

6.2
Sanitation
and
hygiene



INDICATORS	CUSTODIANS
6.1.1 Proportion of population using safely managed drinking water services	WHO, UNICEF
6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water	WHO, UNICEF
6.3.1 Proportion of domestic and industrial wastewater flows safely treated	WHO, UN-Habitat, UNSD
6.3.2 Proportion of bodies of water with good ambient water quality	UNEP
6.4.1 Change in water-use efficiency over time	FAO
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	FAO
6.5.1 Degree of integrated water resources management	UNEP
6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation	UNECE, UNESCO
6.6.1 Change in the extent of water-related ecosystems over time	UNEP, Ramsar
6.a.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan	WHO, OECD
6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	WHO, OECD

Data for implementation

Purpose of global indicators (national aggregates):

- Broadly track progress
- Communicate needs
- Ensure accountability

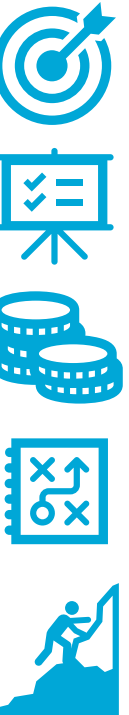


For policy- and decision-making at national level:

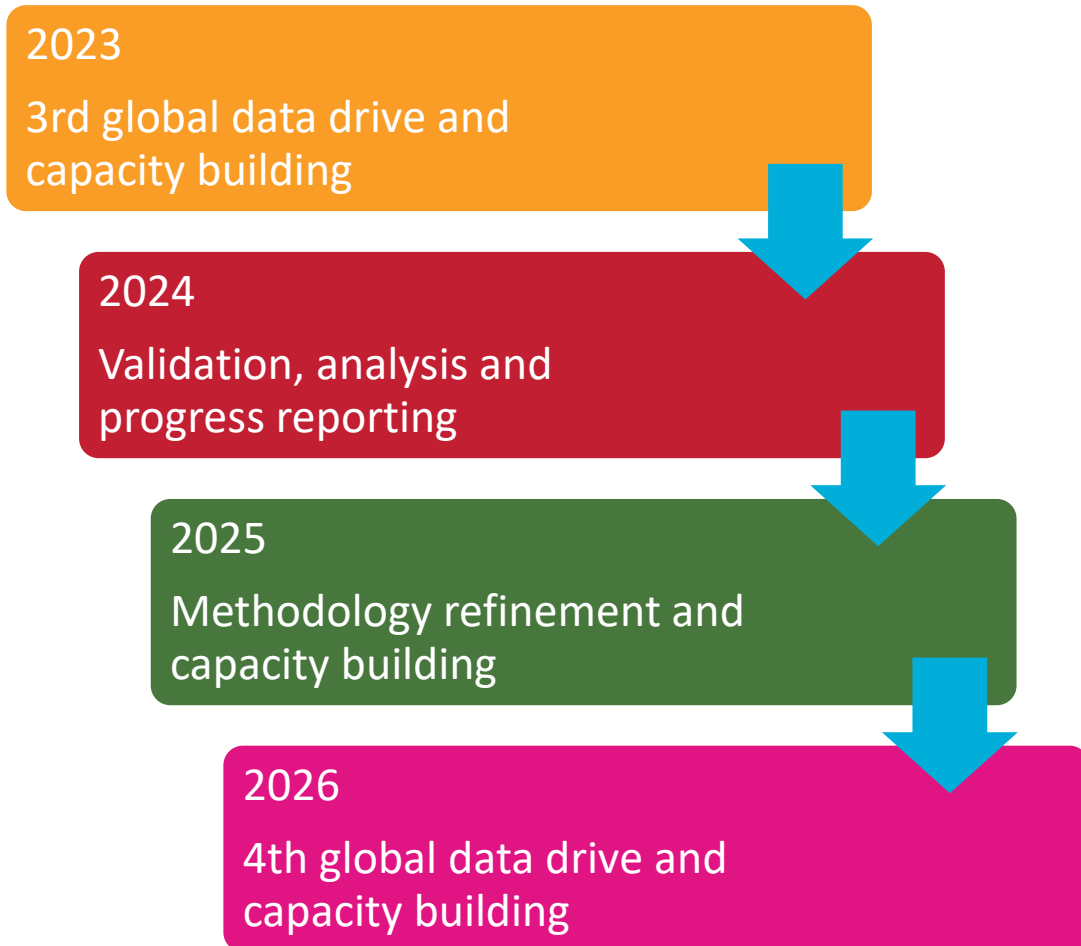
- Global indicators disaggregated and contextualized
- Complementary national indicators

National processes in need of evidence:

- National target-setting
- Policy development
- Strategy development
- Budget allocations
- Joint Sector Reviews
- Voluntary National Reviews
- Common Country Assessment
- Commitments to Water Action Agenda



SDG 6 monitoring activities 2023-2026



2023 Data Drive

- March-October 2023

Other activities

- Water basin disaggregation (basin pilots)
- Gender contextualization (country pilots)
- Indicators interlinkages

Governance

TAU, Strategic Advisory Group (SAG), Steering Committee, ext. evaluation/recommendations

Country Acceleration Case Studies to explore countries' pathways to achieving accelerated progress on SDG 6: Brazil, Costa Rica, Ghana, Pakistan, Senegal, Singapore

Country focal points for SDG 6 monitoring



Indicator-specific focal points

- Main point of contact for UN custodian agencies, receives data requests and capacity building support
- Works together with colleagues within and outside their organization to compile data on respective indicator
- Typically these focal points are coming from many different line ministries and institutions

National statistical office (NSO) focal points

- Main point of contact for UN Statistical Division
- Has overall responsibility for SDG reporting on behalf of the country
- Works together with indicator-specific focal points and overall focal points to compile data
- Copied to data requests from UN custodian agencies



Overall focal points

- Main point of contact for IMI-SDG6, receives information about cross-cutting and institutional issues related to SDG 6 monitoring, reporting, analysis and data use
- Works together with indicator-specific focal points and NSO focal points to promote coordination and collaboration across indicators
- Copied to data requests from UN custodian agencies



Recommendation: Organize regular meetings for all focal points to discuss the work, to analyse and use data for integrated policies, planning and management!





UN WATER

INTEGRATED MONITORING
INITIATIVE FOR SDG 6

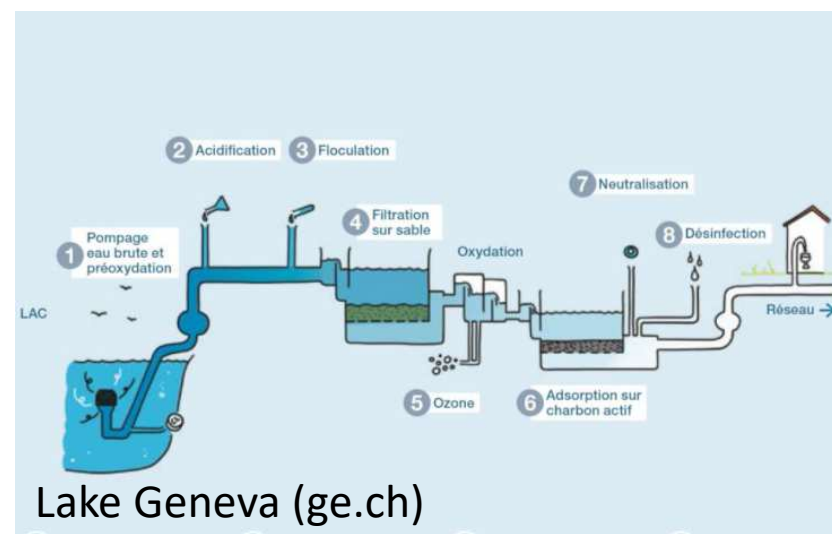
SDG 6.1
DRINKING WATER

SDG 6.2
**SANITATION AND
HYGIENE**

World Health Organization (WHO)
United Nations Children's Fund (UNICEF)



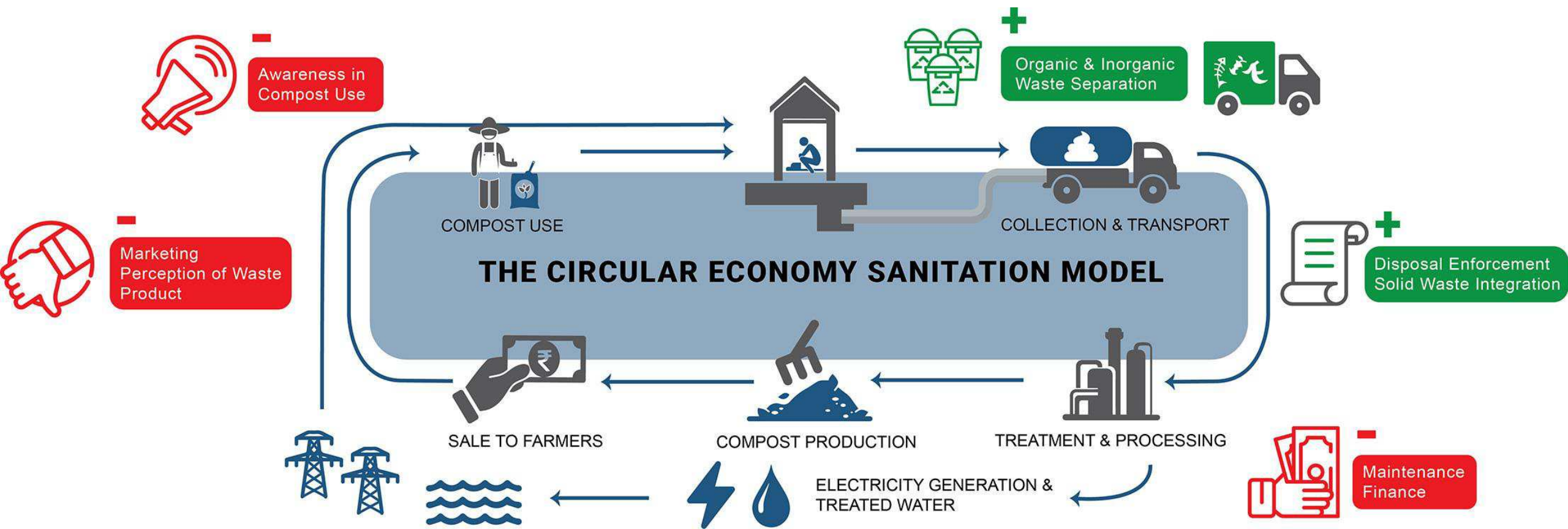
Smart Water Management Systems and advanced water monitoring systems (sensors, data analytics, and learning algorithms to monitor water usage, detect leaks, and optimize water treatment processes) and Decentralized Water Systems (treat and distribute water on a smaller scale, closer to where it is needed) can help utilities and industries to reduce water losses, lower energy consumption, and improve water quality.



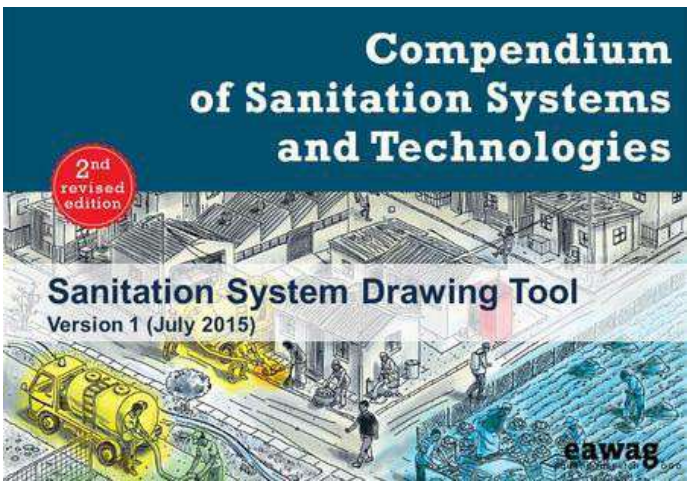
Water treatment technologies: Membrane, carbon-based purification, disinfection solutions, desalinisation, IoT, nanofiltration, etc.



The WATA device only need water and simple table salt to inexpensively produce active chlorine.



Mallory et al., 2020





UN WATER

INTEGRATED MONITORING INITIATIVE FOR SDG 6

SDG 6.3.1

PROPORTION OF WASTEWATER FLOW (SAFELY) TREATED

WORLD HEALTH ORGANIZATION (WHO)

UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME (UN-HABITAT)

UNITED NATIONS STATISTICS DIVISION (UNSD)

List of wastewater treatment technologies

2 languages

Article Talk

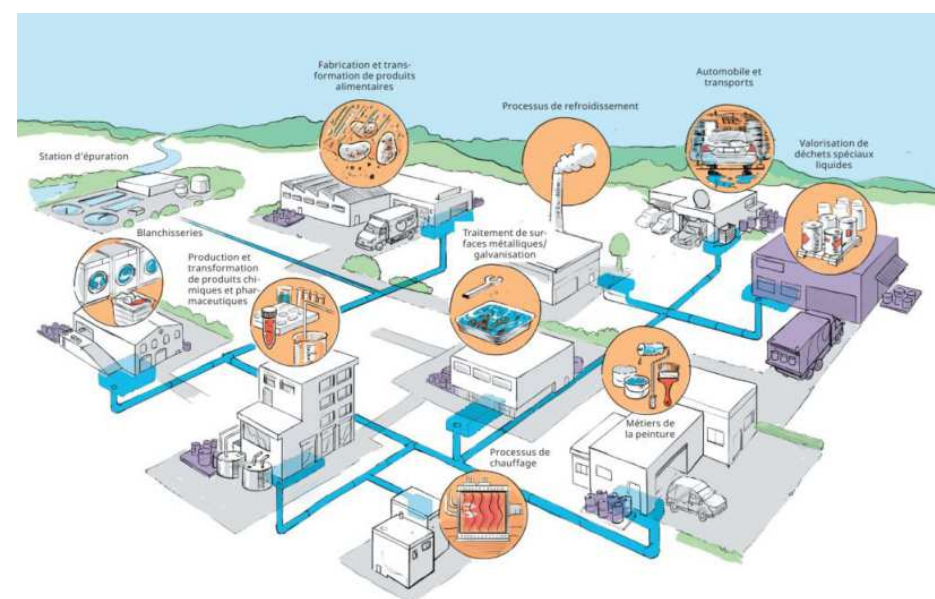
From Wikipedia, the free encyclopedia

Read Edit View history Tools

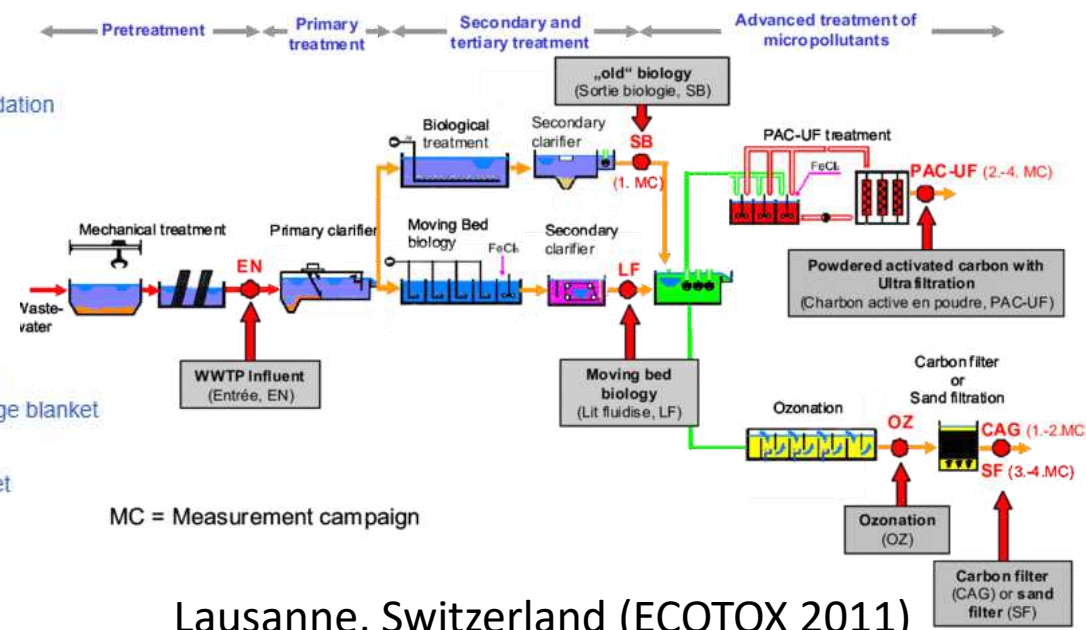
This list is incomplete; you can help by adding missing items. (August 2008)

This page consists of a **list of wastewater treatment technologies**:

- Activated sludge model
- Activated sludge systems
- Adsorption/Bio-oxidation process
- Advanced oxidation process
- Aerated lagoon
- Aerobic granular reactor
- Aerobic granular sludge technology
- Aerobic granulation
- Aerobic treatment system
- Anaerobic clarigester
- Anaerobic digester types
- Anaerobic digestion
- Anaerobic filter
- Anaerobic lagoon
- Anammox
- API oil–water separator
- Belt filter
- Bioconversion of biomass to mixed alcohol fuels
- Biofilters
- Bioreactor
- Bioretention
- Capacitive deionization
- Carbon filtering
- Cesspit
- Chemical addition wastewater treatment
- Clarifier
- Coarse bubble diffusers
- Composting toilet
- Constructed wetland
- Cross-flow filtration
- Dark fermentation
- Decanter centrifuge
- Decentralized wastewater system
- Diffuser (sewage)
- Dissolved air flotation
- Dissolved gas flotation
- Desalination
- Distillation
- Effluent Decontamination System
- Electro-oxidation
- Electrocoagulation
- Electrodeionization
- Electrodialysis
- Electrolysis
- Enhanced biological phosphorus removal
- Expanded granular sludge bed digestion
- Extended aeration
- Facultative lagoon
- Fenton's reagent
- Filtration
- Fine bubble diffusers
- Flocculation & sedimentation
- Flotation process
- Forward osmosis
- Froth flotation
- Hydrocyclone
- Imhoff tank
- Induced gas flotation
- Integrated fixed-film activated sludge (IFAS)
- Ion exchange
- Lamella clarifier (inclined plate clarifier)^[1]
- Living Machine
- Maceration (sewage)
- Media filter
- Membrane bioreactor
- Membrane distillation
- Membrane fouling
- Microbial fuel cell
- Microflotation
- Moving bed biofilm reactor
- Nanotechnology
- Nereda
- NERV (natural endogenous respiration vessel)
- Oil–water separator
- Organisms used in water purification
- Parallel plate oil–water separator
- Photobioreactor
- Reed bed
- Regenerative thermal oxidizer
- Retention basin
- Reverse osmosis
- Rotating biological contactor
- Sand filter
- Screen filter
- Sedimentation (water treatment)
- Septic tank
- Septic tank conversion^[2]
- Sequencing batch reactor
- Sewage treatment
- Skimmer (machine)
- Slow sand filter
- Stabilization pond
- Supercritical water oxidation (SCWO)
- Thermal hydrolysis
- Treatment pond
- Trickle-bed reactor
- Trickling filter
- Ultrafiltration
- Ultraviolet disinfection
- Upflow anaerobic sludge blanket digestion
- Urine-diverting dry toilet
- Vermifilter
- Vacuum evaporation
- Wet oxidation

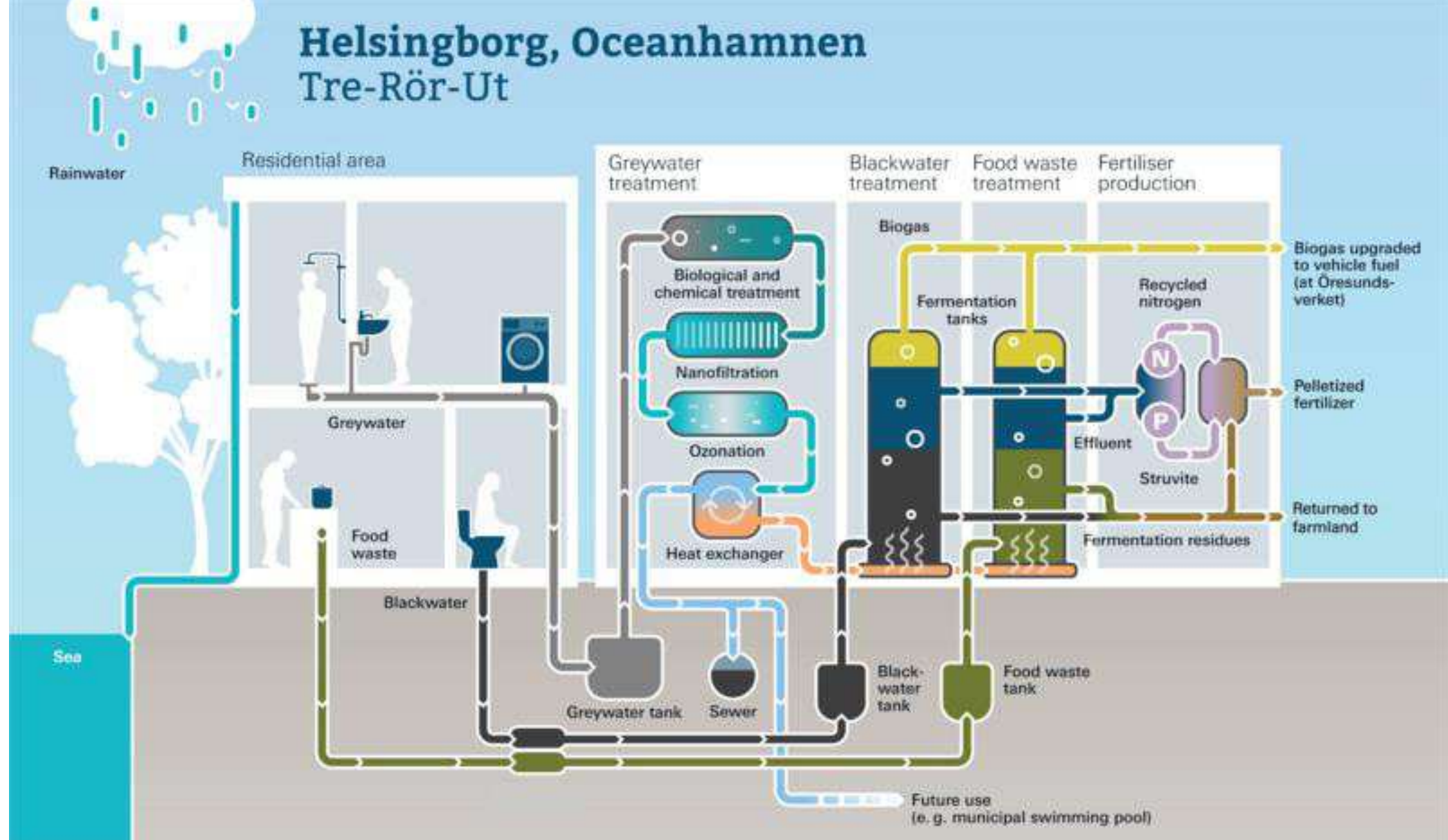


Non-domestic pollutant sources
→ Quaternary treatment for micro pollutants (VSA Switzerland)



Lausanne, Switzerland (ECOTOX 2011)

Helsingborg, Oceanhamnen Tre-Rör-Ut

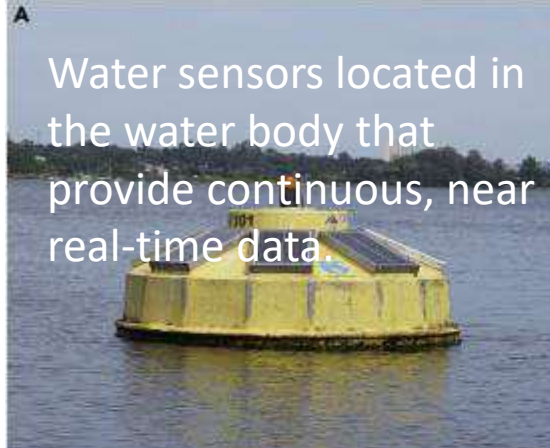


Sweden. The system recovers biogas for vehicle fuel, nutrients for fertiliser production, concentrated sludge for agricultural application, and greywater for reuse water (EAWAG)

SDG 6.3.2

**PROPORTION OF BODIES OF WATER
WITH GOOD AMBIENT WATER QUALITY**

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)



Water sensors located in the water body that provide continuous, near real-time data.



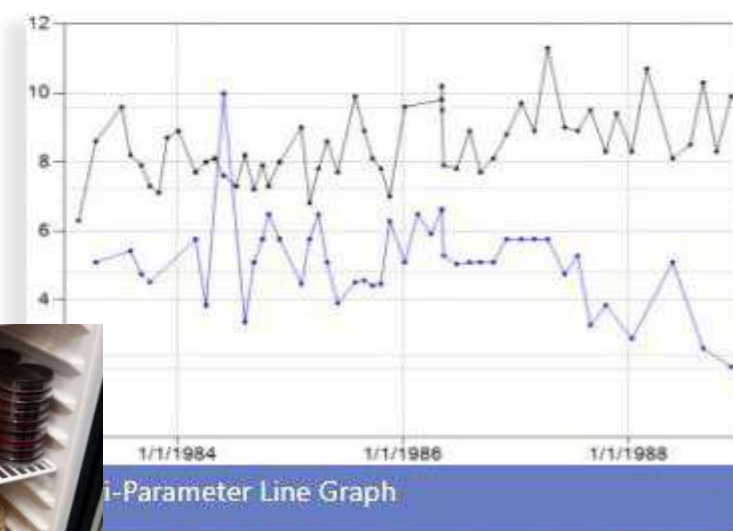
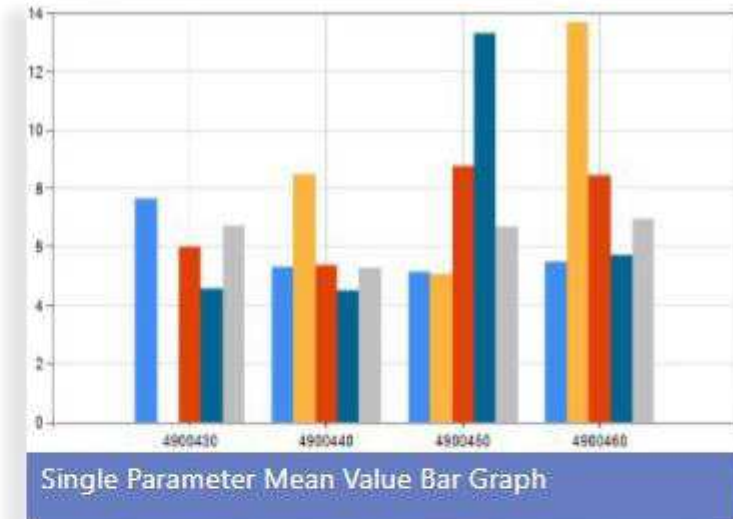
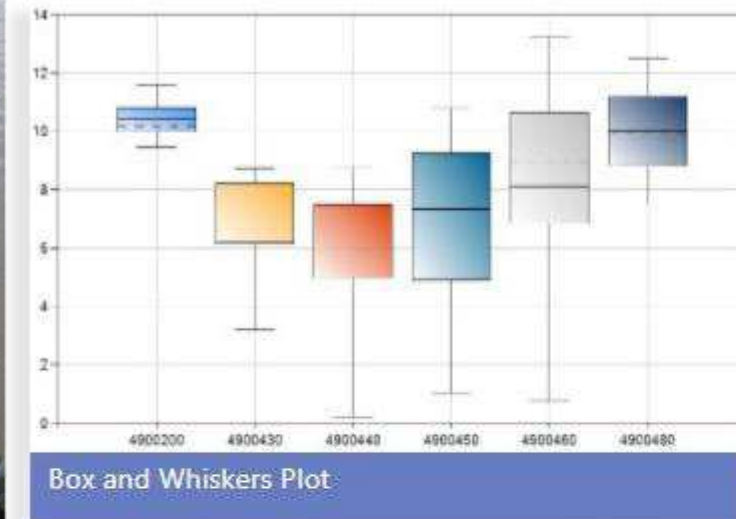
In situ measurements with a sensor.



Grab sample for later analysis in the laboratory



Examining/analyzing the aquatic communities



Chapman et al., 2022



Water Quality Management System (AWQMS) and (public) portal

ICPMS for trace elements (heavy metals) and faecal bacteria analysis



UN WATER

INTEGRATED MONITORING INITIATIVE FOR SDG 6

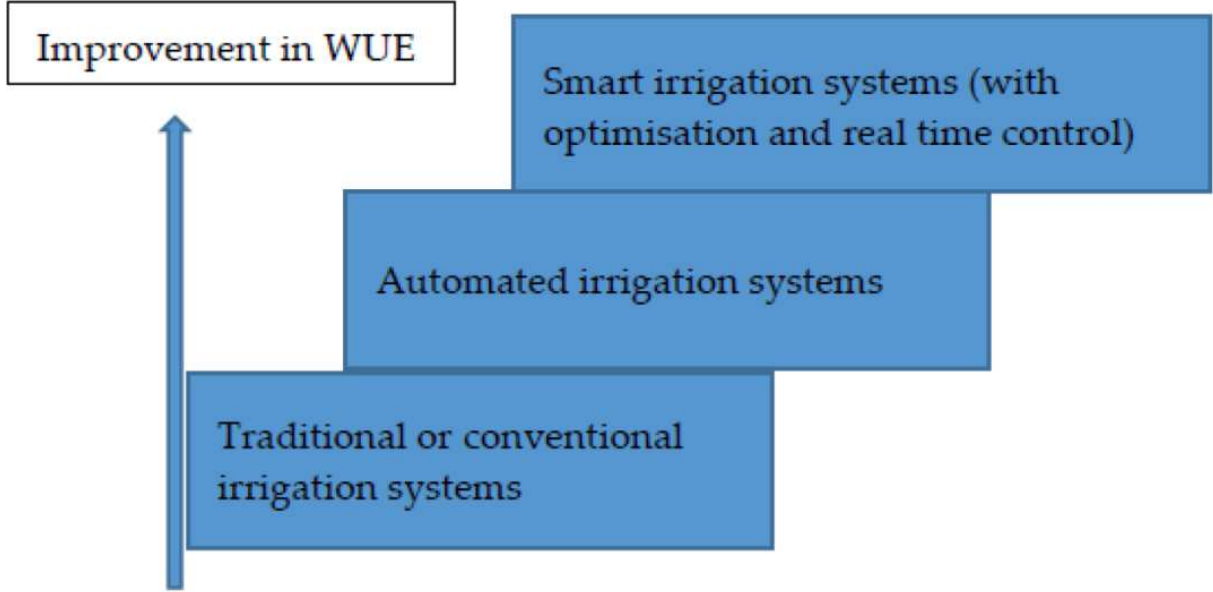
SDG 6.4.1

CHANGE IN WATER-USE EFFICIENCY

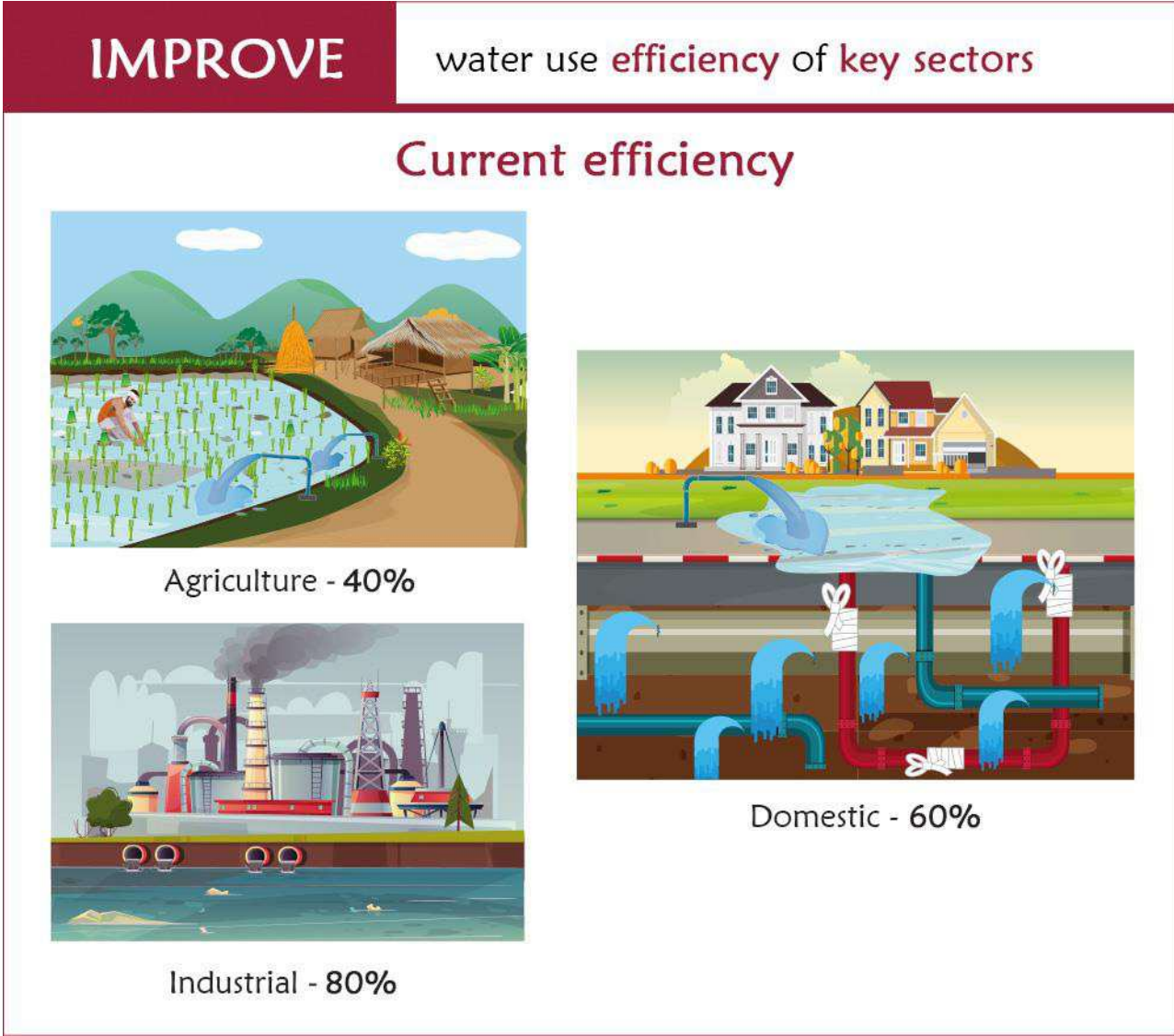
OVER TIME

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)

Improvements in irrigation infrastructure through modernisation and automation, real-time control and optimization, increased use of remote sensing techniques, wireless communication systems and more versatile sensors.



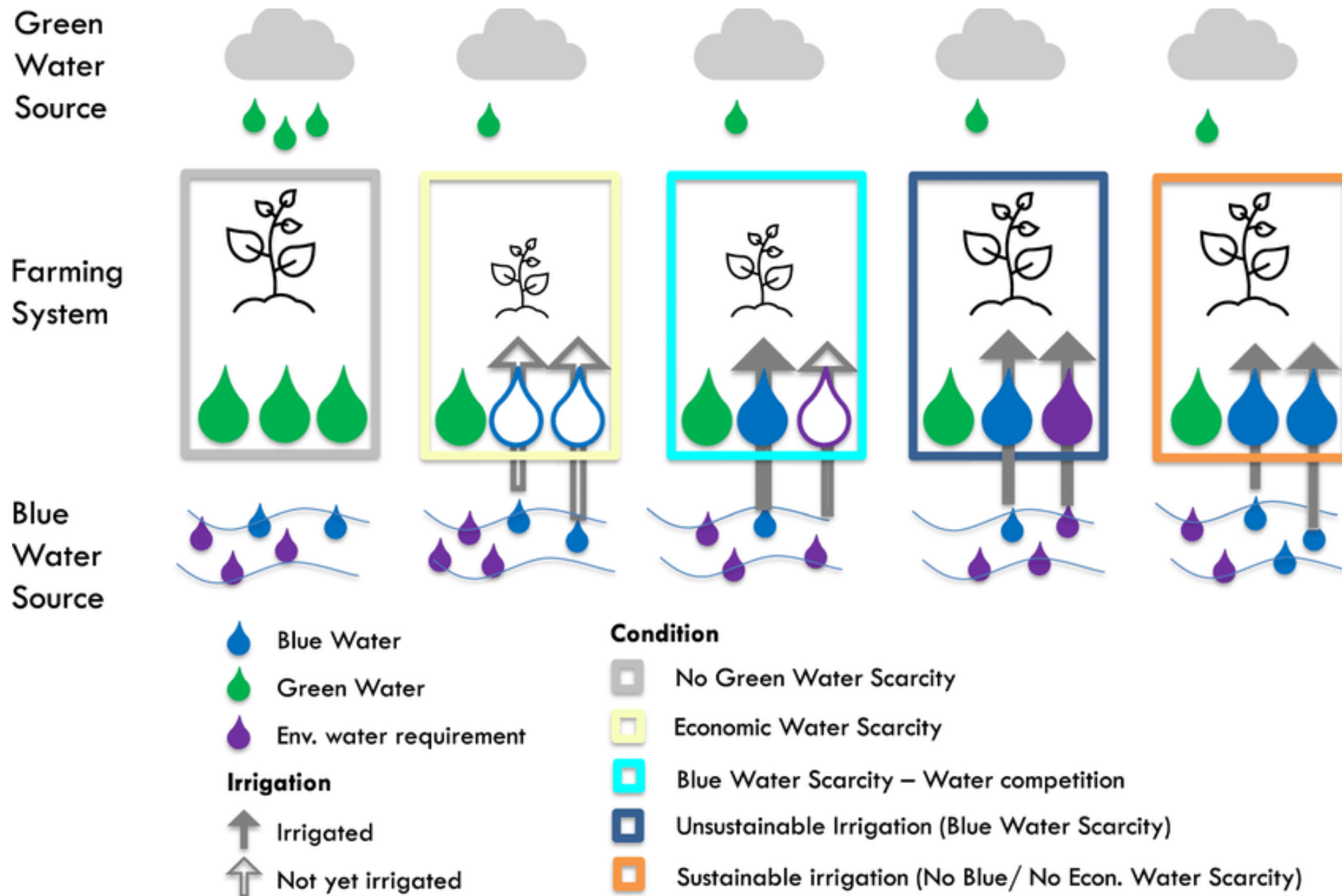
→ Undertake exercises like water audit, estimating water footprint of the products, etc. for industries and at city scale



SDG 6.4.2

**LEVEL OF WATER STRESS: FRESHWATER
WITHDRAWAL AS A PROPORTION OF
AVAILABLE FRESHWATER RESOURCES**

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)





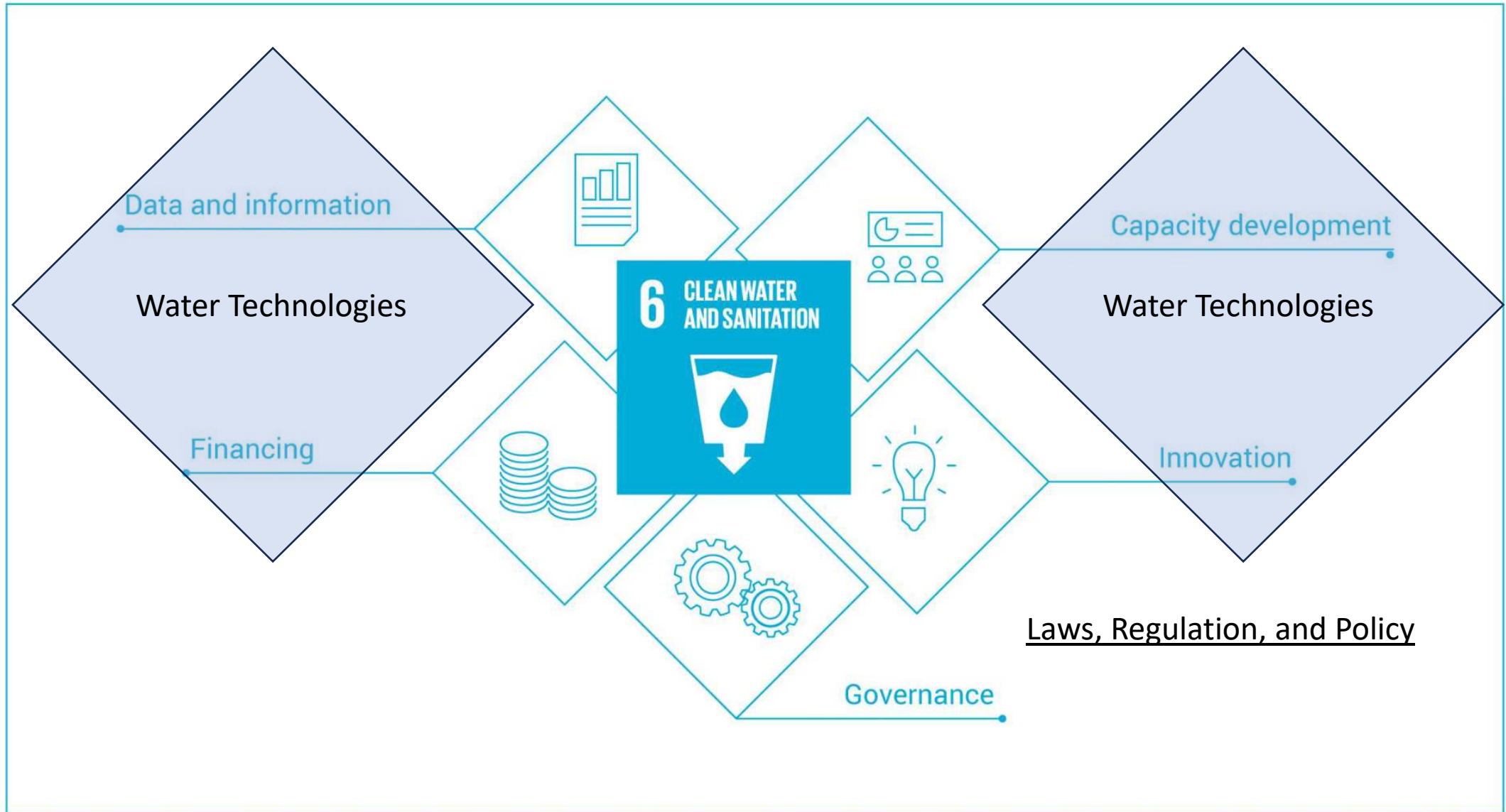
UN WATER

INTEGRATED MONITORING INITIATIVE FOR SDG 6

SDG 6.5.1

**DEGREE OF INTEGRATED WATER
RESOURCES MANAGEMENT
IMPLEMENTATION (0-100)**

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)





UN WATER

INTEGRATED MONITORING INITIATIVE FOR SDG 6

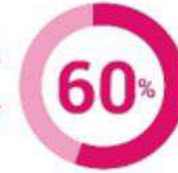
SDG 6.5.2

**PROPORTION OF TRANSBOUNDARY BASIN AREA
WITH AN OPERATIONAL ARRANGEMENT FOR
WATER COOPERATION**

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE (UNECE)
UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION (UNESCO)

SDG 6.5.2 TRANSBOUNDARY COOPERATION

Transboundary waters
account for



of the world's
freshwater flows

Cooperation over these
waters is essential for **peace,**
sustainable development, and regional
stability



An operational agreement must meet **4 criteria**



A **joint body** (e.g., a river
basin organization)



Annual **exchange of**
data and information



Annual **meetings** between
riparian countries (at political or
technical level)



Joint **objectives** or joint/coordinated
management plan(s)



UN WATER

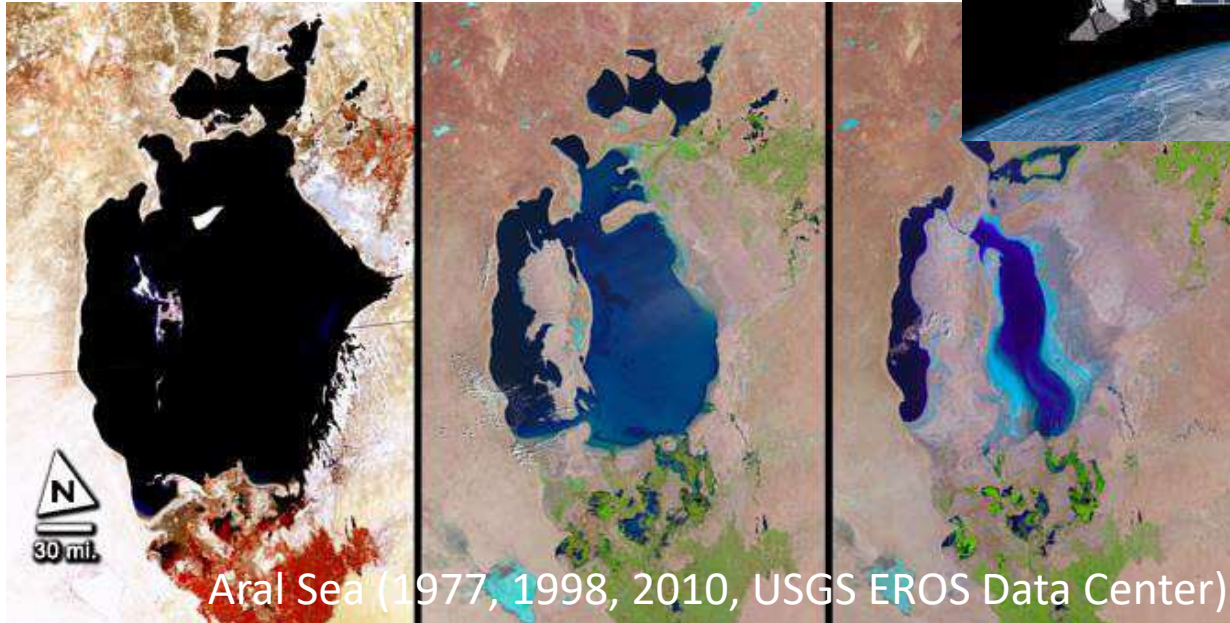
INTEGRATED MONITORING INITIATIVE FOR SDG 6

SDG 6.6.1

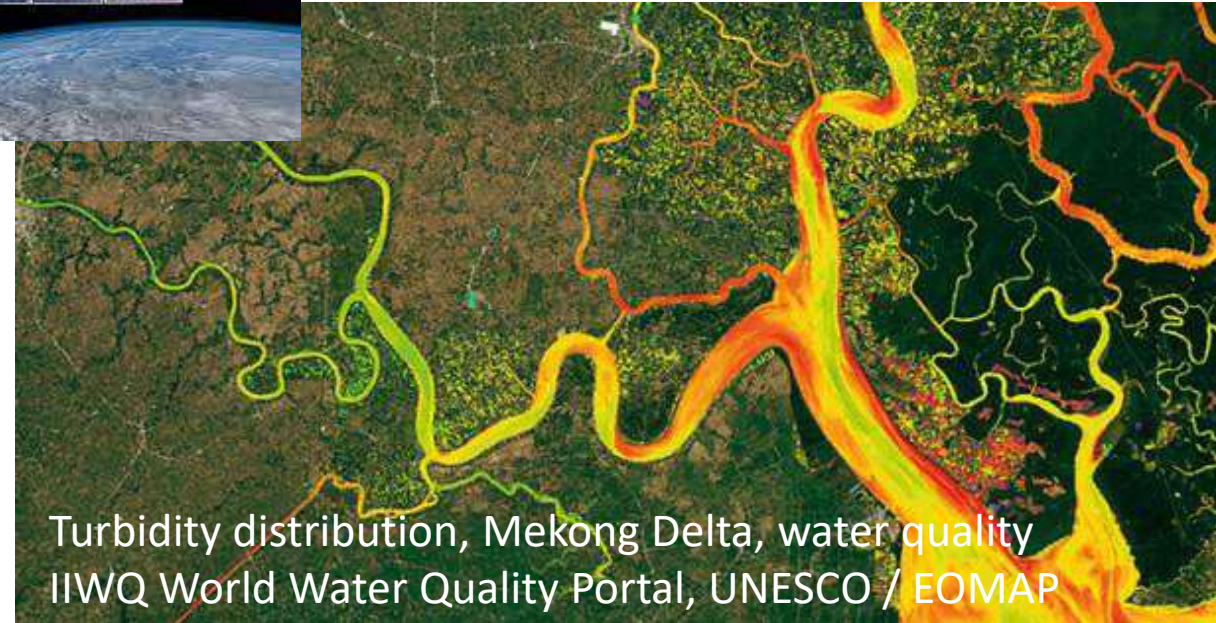
**CHANGE IN THE EXTENT OF WATER-
RELATED ECOSYSTEMS OVER TIME**

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

Severe die-off of mangroves along Australia's northern coast (July 2014-2016, NASA EOI using Landsat)



Aral Sea (1977, 1998, 2010, USGS EROS Data Center)



Turbidity distribution, Mekong Delta, water quality
IIWQ World Water Quality Portal, UNESCO / EOMAP

UN-WATER INTEGRATED MONITORING INITIATIVE FOR SDG 6 (IMI-SDG6)



Learn more about all SDG 6 global indicators

<https://www.sdg6monitoring.org/>

- Discover the methodologies
- See the timeline for country reporting
- Get support from IMI-SDG6 and learn from other countries

<https://www.sdg6data.org/>

- Track progress on water and sanitation – globally, regionally and nationally
- View, analyse and download data through maps, charts and tables
- Discover how SDG 6 links to other SDGs