



# Water Quality and Monitoring

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**Briefing to the Committee on Permanent Representatives**

**16 March 2017**

# The world's water quality crisis

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## Key Messages:

- Human activity and population growth put tremendous pressure on the world's freshwater resources.
- There has been a 30% decline in biodiversity health since 1970. Degradation of biodiversity of freshwater ecosystems has particularly dire consequences for fish: more than 40% of freshwater fish species in the United States and Europe were in imminent danger of extinction (Millennium Ecosystem Assessment 2005).
- Pollution through **pathogens, organic matter, chemicals and salinity** are of particular concern – up to 1/3 of all rivers could be affected.
- Pollution threatens human health and ecosystem services.



# Water quality and UN Environment's mandate

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- Addressing water quality and pollution form a key part of UN Environment's mandate.
- IWQGES mandated by GC Decision 27/3 in February 2013.
- GEMS / Water was strengthened through UNEA Resolution 1/9.



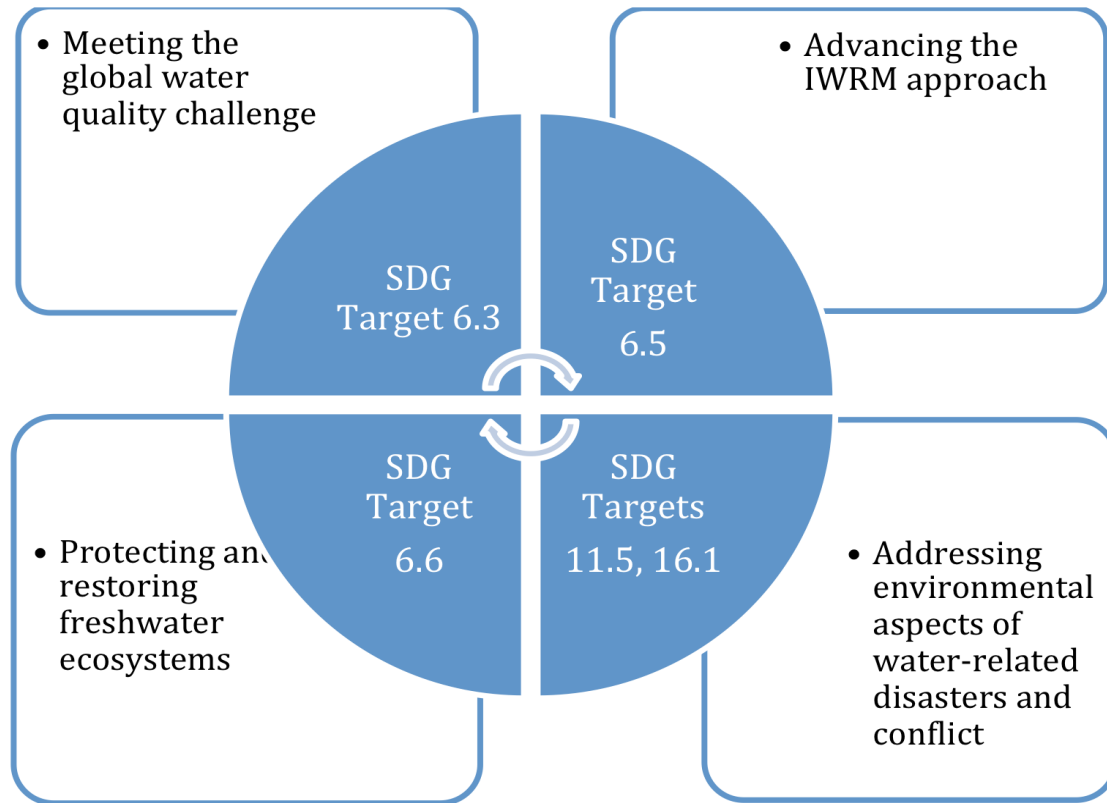
# Water quality in the SDG context

- The 2030 Agenda adds an important new mandate and opportunity for UN E
- Under UN-Water, UN Environment is engaged in integrated monitoring and reporting for SDG 6:  
[www.sdg6monitoring.org](http://www.sdg6monitoring.org)
- UN Environment has global custodianship of data collection for indicators in SDG targets 6.3, 6.5 and 6.6 – all connect to water quality.



# UN Environment Strategic Priorities for Freshwater , 2017 - 2021

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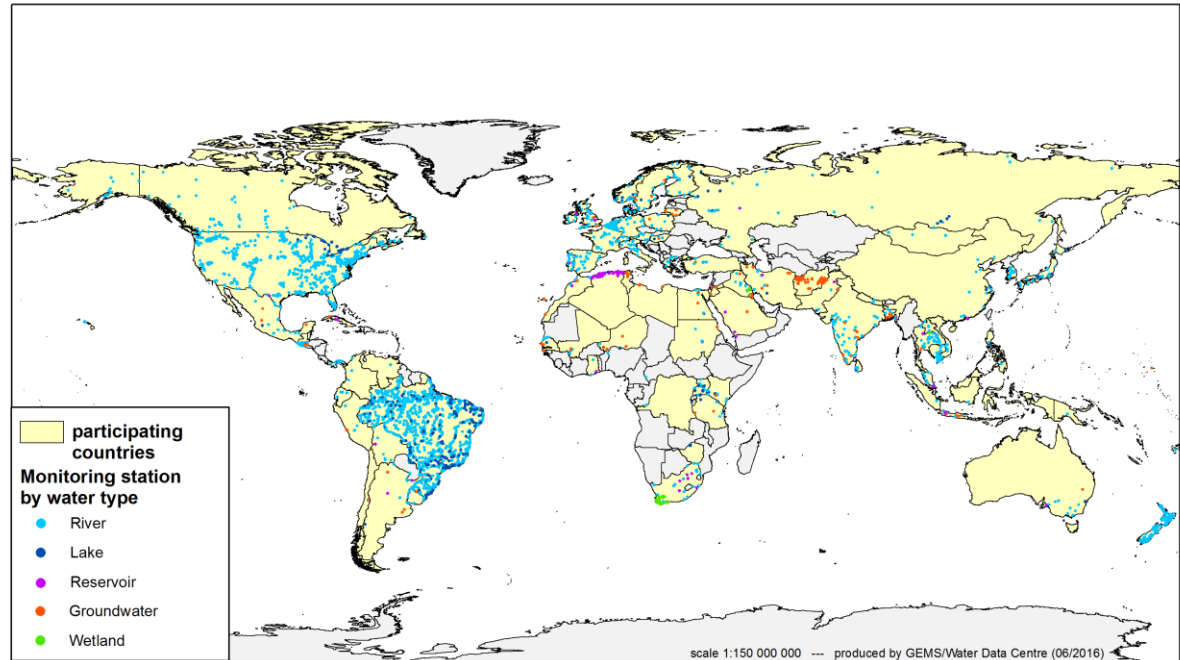


# About Global Environment Monitoring System GEMS / Water – a global network

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A global network with different partners engaged in:

- Capacity development
- GEMStat water quality database
- Water quality monitoring



# About GEMS / Water – Capacity development


Menu Glossary

- Procedure
- Quality Assurance
- Quiz 2
- Question 1
- Question 2
- ▼ Core Parameter 3: Faecal Coliform Bacteria
  - Title Slide
  - Background Information
  - Recommended Methods
  - Apparatus for Filtration
  - Selection of Sample Size 1
  - Selection of Sample Size 2
  - Preparation of Culture Dish
  - Filtration of Sample
  - Filtration of Sample 2
  - Incubation of Sample 2
  - Counting
  - Calculation of Coliform Density
  - Quality Assurance
  - Quiz 3
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  - Question 2
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  - Question 6
- ▼ Core Parameter 4: Nitrogen
  - Title Slide
  - Background Information
  - Background Information 2
  - Background Information 3
  - Background Information 4
  - Recommended Methods
  - Apparatus
  - Measurement of Nitrate

SDG Indicator 6.3.2

Resources

## Faecal Coliform Bacteria: Incubation



[www.ucc.ie/en/gemscdc/](http://www.ucc.ie/en/gemscdc/)  
[gemscdadmin@ucc.ie](mailto:gemscdadmin@ucc.ie)

UNEP Water UCC

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# About GEMS / Water – Water quality monitoring

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- Training and support for ambient water quality monitoring network development and implementation
- Help and advice in selecting target values
- Data handling, reporting and visualisation



6.3: Proportion of **bodies of water** with **good** ambient water quality

6.6: Extent of change in water-related ecosystems



# International Water Quality Guidelines for Ecosystems

- IWQGES are advisory in nature and provide a basis for both those without any water guidelines & those with guidelines can identify areas to improve for better ecosystem integrity
- Water quality, quantity and physical habitats considered for preservation of ecosystems
- They provide a base for setting national water quality policy and implementation

# Typology of water bodies

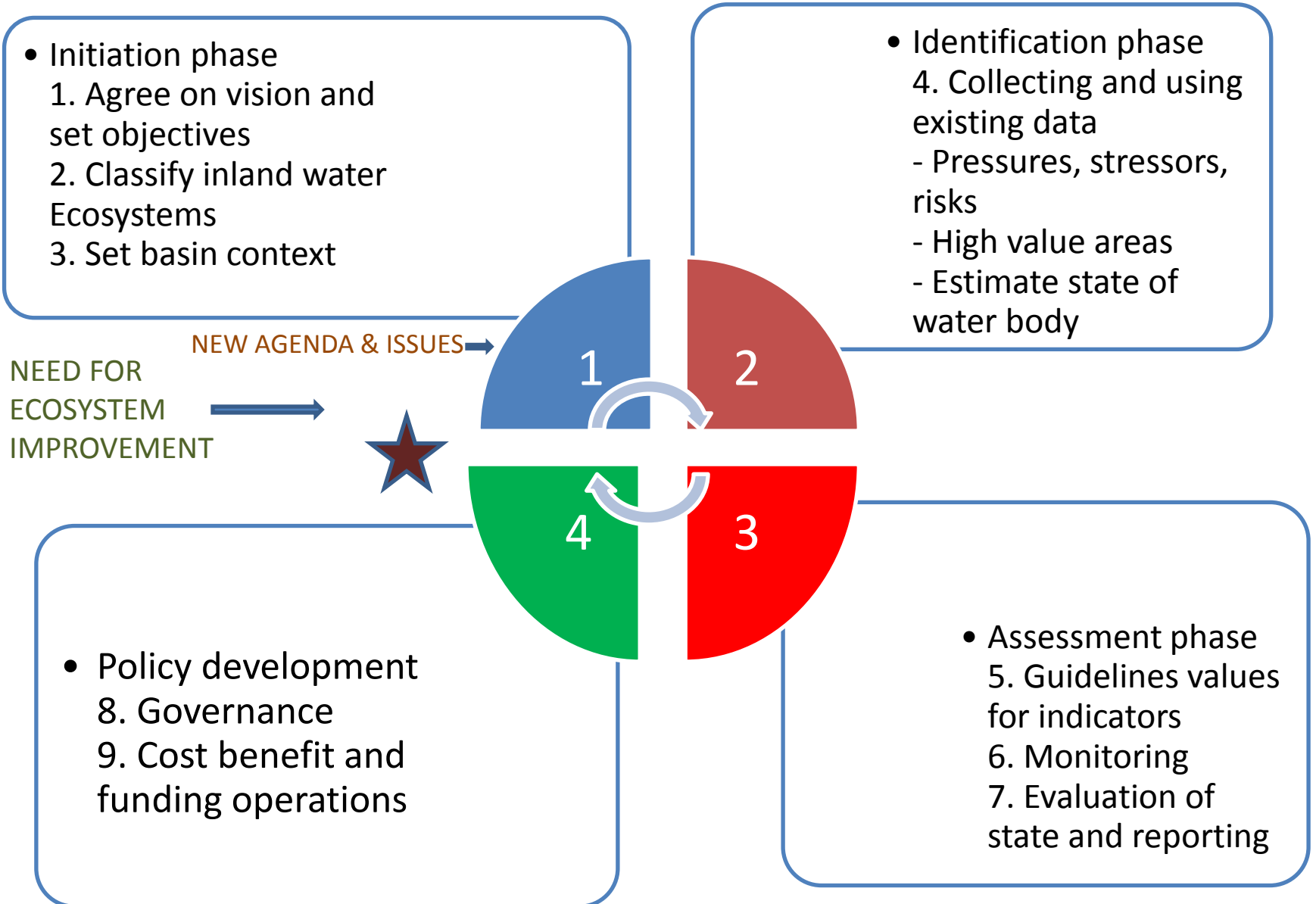
- Running water ecosystems (streams & rivers)
- Standing water ecosystems (lakes & reservoirs)
- Wetland ecosystems
- Groundwater



# Freshwater Ecosystem Health

Type of ecosystem : running water & associated wetlands; standing water; wetland systems	Description
1. High Ecosystem Integrity	The desired end More of reference state Must be guarded
2. Minimally to moderately disturbed	Management to develop to 1 1&2 offer services to humans without fear of disease Are able to restore naturally
3. Highly disturbed	Critical management necessary to stop further deterioration Clear negative impacts on ecosystem integrity functions
4. Extreme impairment	Negatively impacted Point of no return 3& 4 - may target for a <b>Best Attainable Condition</b> through creating artificial ecosystem

# 4 phases of 9 steps of IWQGES



# National and regional consultations

Regional Consultations of the International Water Quality Guidelines for Ecosystems (IWQGES)				
	Conference/ Meeting/ Workshop	Dates	Venue	Countries in attendance
1	UNEA 2 - Side Event	May-16	Nairobi, Kenya	Kenya, Germany, Switzerland, Ireland, Brazil, Zimbabwe, Canada and several other countries
2	Africa Water Week	Jul-16	Dar es Salaam, Tanzania	IWQGES session: Mozambique, Cameroon, Nigeria, Tanzania, Uganda, Mali. Information sharing and informal consultations at the UN Environment booth
3	World Water Week	Aug-16	Stockholm, Sweden	Information sharing and informal consultations in connection with sessions and at the UN Environment booth
4	IWA Congress and Exhibition	Oct-16	Brisbane, Australia	Australia, India, Vanuatu, Papua New Guinea, Chile, Kenya, Denmark
5	Cap-Net Workshop	Nov-16	Nairobi, Kenya	South Africa, EU, The Caribbean, Cameroon, Malaysia, Trinidad and Tobago, Costa-Rica, Germany, Uganda, Nigeria, Kenya, India
6	Country Specific Consultations	December 2016 - February 2017	Documents sent out via email to target countries for detailed comments	<p><b>Responded</b> Burundi, USA, South Africa, Iran, Slovakia, Zimbabwe, Ireland, Turkey,</p> <p><b>No Feedback Received</b> Argentina, Azerbaijan, Central Africa Republic, Cote d'Ivoire, Denmark, Ethiopia, Ghana, Guinea Conakry, Iraq, Malawi, Belgium, Uganda, Bosnia and Herzegovina, Libya, China, Germany, Pakistan, Estonia, Korea, Romania, Netherlands, Brazil, Sri Lanka,</p>



# Summary of comments from Regional Consultations – next steps

- Most developing countries have no set guidelines for aquatic ecosystems.
- Most countries are happy with UN Environment's work on the guidelines as a **framework** to help to improve the monitoring of the water quality of our ecosystem.
- Some of the indicators found most useful in establishing the guidelines include: Dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD); Temperature; pH; Light penetration (Secchi depth); Conductivity/salinity; Nutrients (N, P, NH<sub>4</sub>, NO<sub>x</sub>, soluble P); Chlorophyll A
- Revision of documents underway - making the case better, linking to SDGs more clear, explaining the framework approach
- More work on detailed guidance per freshwater ecosystem type and parameter needed.

# What should UN Environment be doing? Meeting the Global Water Quality Challenge

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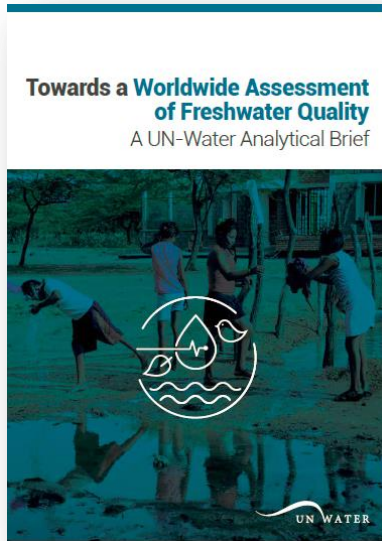
- Help countries make efforts to improve wastewater treatment, reduce water quality degradation in the world's freshwater ecosystems.
- Help countries measure and improve ambient freshwater quality by adopting IWQGES
- Encourage countries to set up WQ monitoring stations and join GEMS /



# What can UN Environment do?

## Target 6.3: Meet the Global Water Quality Challenge

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- To fill the many gaps where water quality data is missing, a **global water quality assessment** should be undertaken

***Snapshot of world water quality***  
**A pre-study for a worldwide assessment**



**Full assessment**

# Target 6.6

## Protect and Restore Freshwater Ecosystems

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- Through the IWQGES, supporting SDG targets 6.3, 6.5 and 6.6 we can help countries to take an ecosystem health perspective and improve ambient freshwater quality.

