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# Groundwater's role in addressing water challenges

From the global agenda to local project implementation

In: Annual Conference UNESCO Chair in Sustainable Water Services (UNECWAS), 3<sup>rd</sup> June 2022



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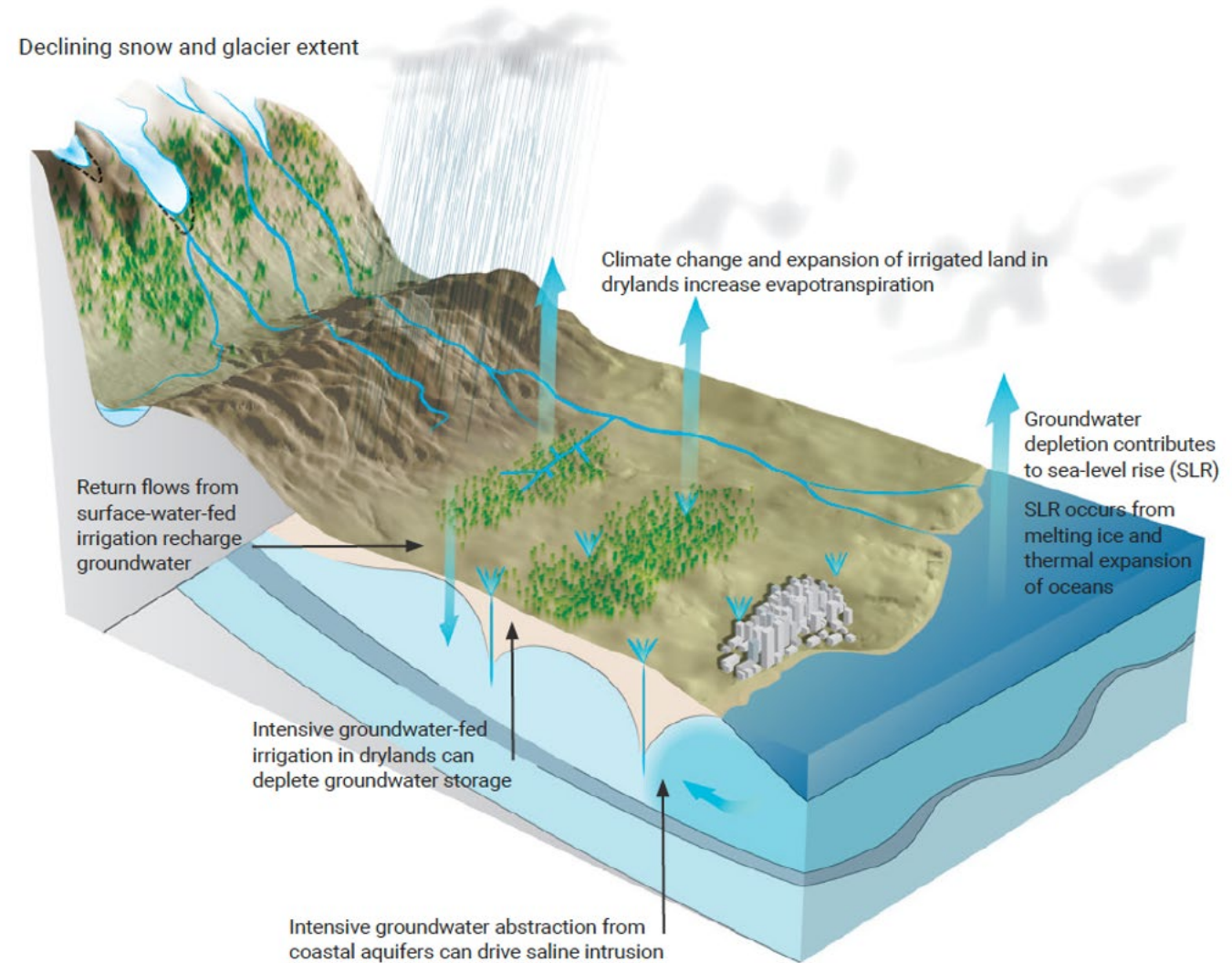
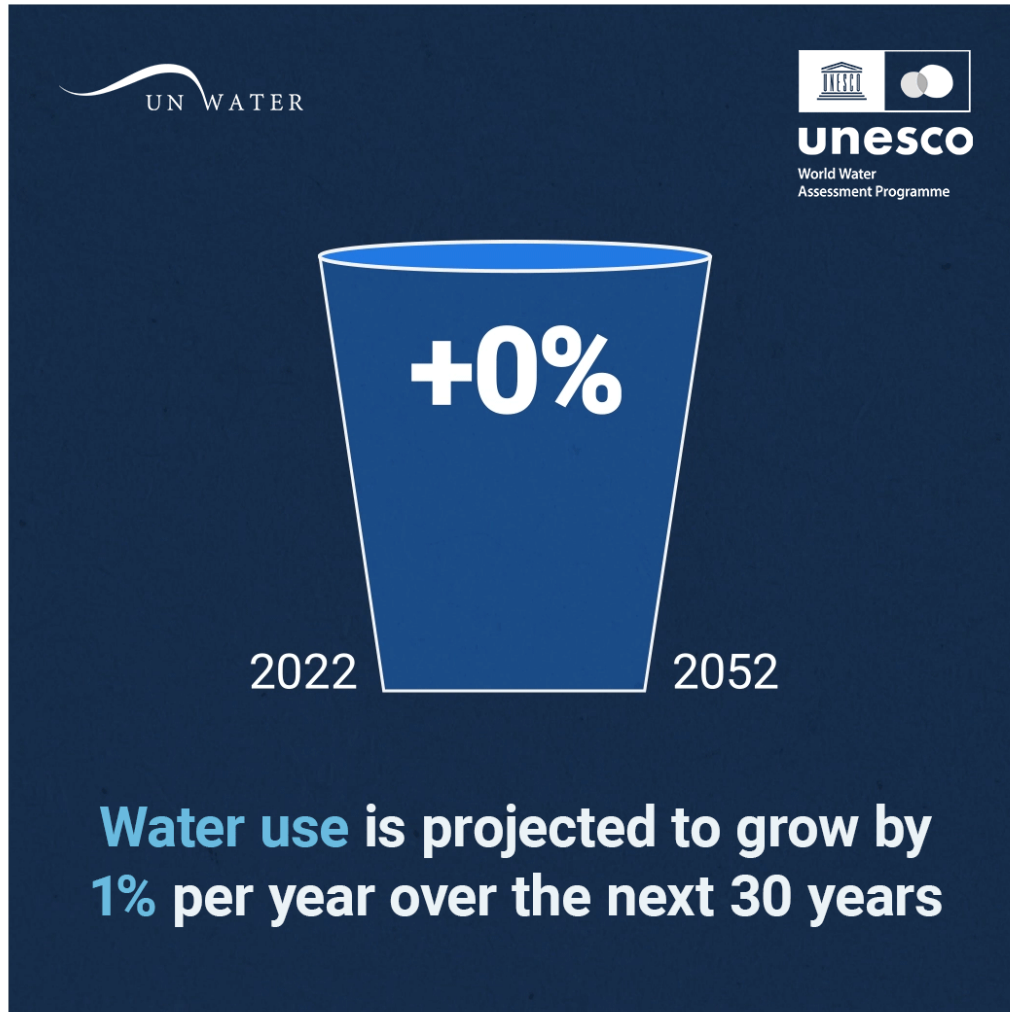
**Ms Luciana Scrinzi | Associate Project Officer, UNESCO-IHP ([l.scrinzi@unesco.org](mailto:l.scrinzi@unesco.org))**

# Outline of the presentation

- **Main water challenges of the XXIst century**
- **Groundwater's role in addressing water challenges**
- **IHP IX 2022-2029: Science for a Water Secure World in a Changing Environment**
- **UNESCO Water Family**
- **Groundwater sustainability and water cooperation: Summary description and key activities (including recent publications)**
- **World Water Development Report 2022**
- **UNESCO in the Integrated Monitoring Initiative for SDG 6 and Global acceleration framework**
- **2022 Groundwater campaign and road to UN Conference 2023**



# Water challenges and groundwater

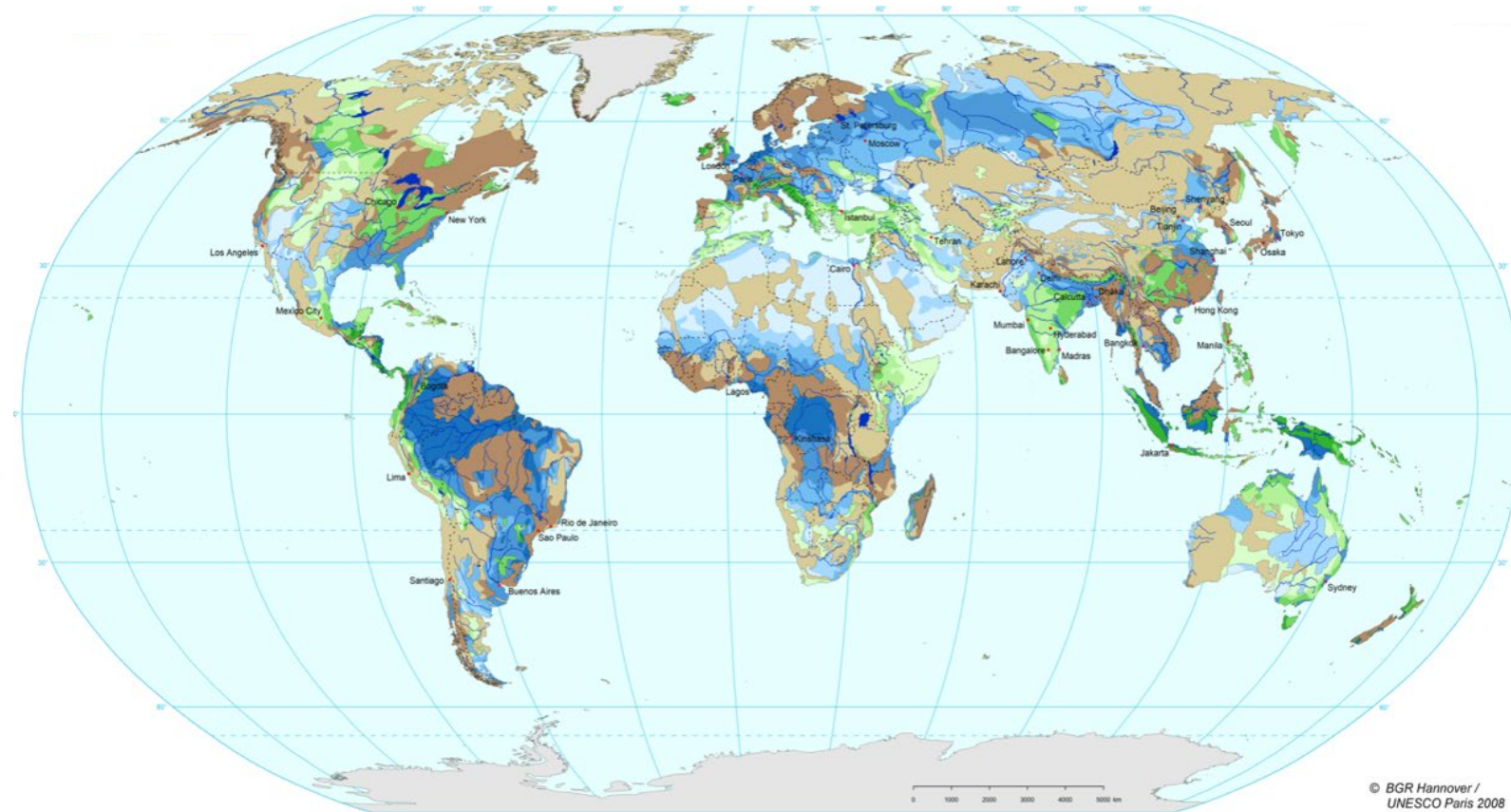


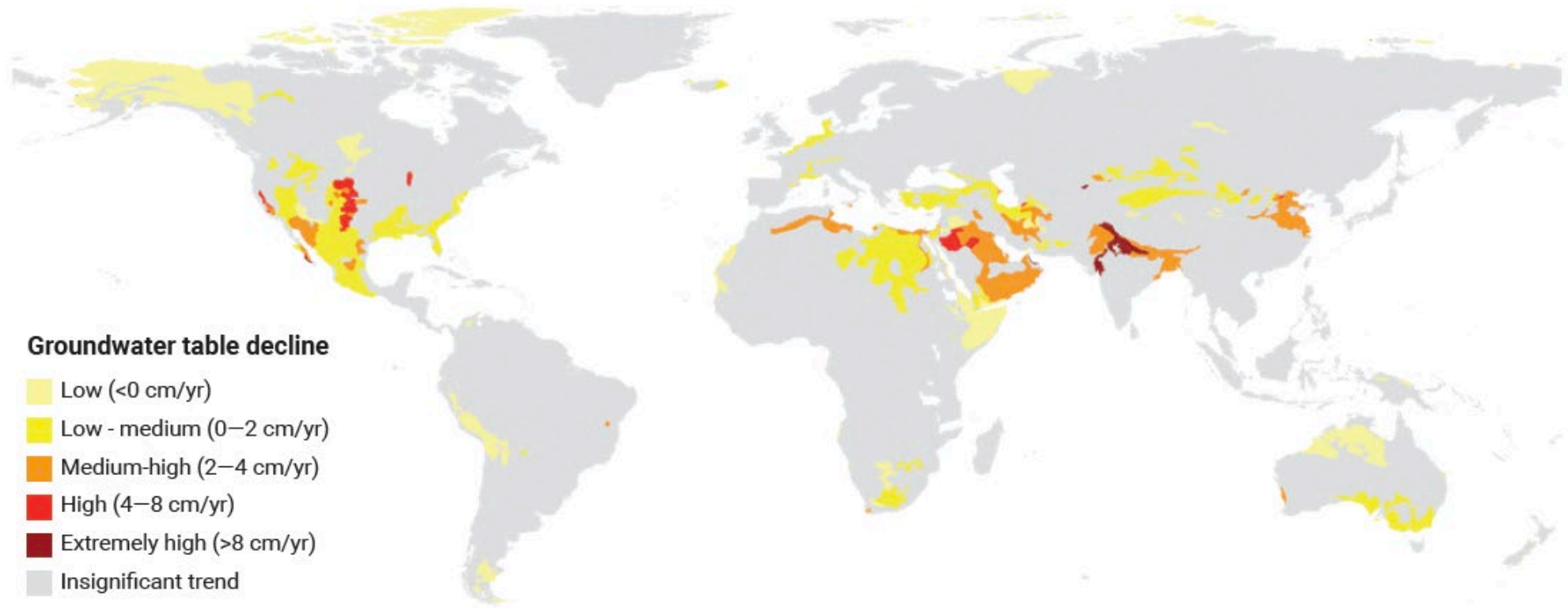
# Importance and distribution of Groundwater Resources in the World

- ❑ Groundwater is the most abundant source of freshwater on earth, accounting for approximately 97% of non-frozen fresh water.
- ❑ Approximately 50% of the world's population drinks groundwater daily.
- ❑ With respect to food production, groundwater is estimated to contribute to over 40 % of the world's production of irrigated crops.
- ❑ Groundwater sustains ecosystems, maintains base flow of rivers
- ❑ Groundwater can play an essential role in climate change adaptation and mitigation,
- ❑ Aquifers can also buffer impacts resulting from seasonal variability and climate change.
- ❑ 40% of the worlds available water is transboundary



Groundwater Resources of the World

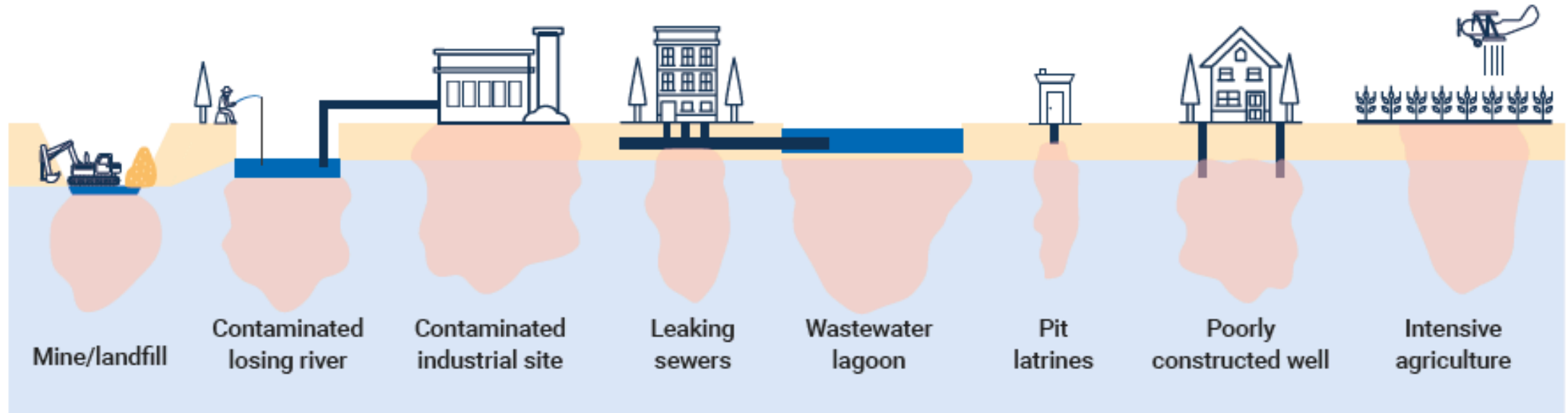




*\*WWDR 2022, Figure 3.2 Groundwater table decline in a selection of the world's major aquifers*

**Most cases of long-term groundwater storage depletion result from intensive groundwater abstraction**

# Groundwater Challenges and Constraints

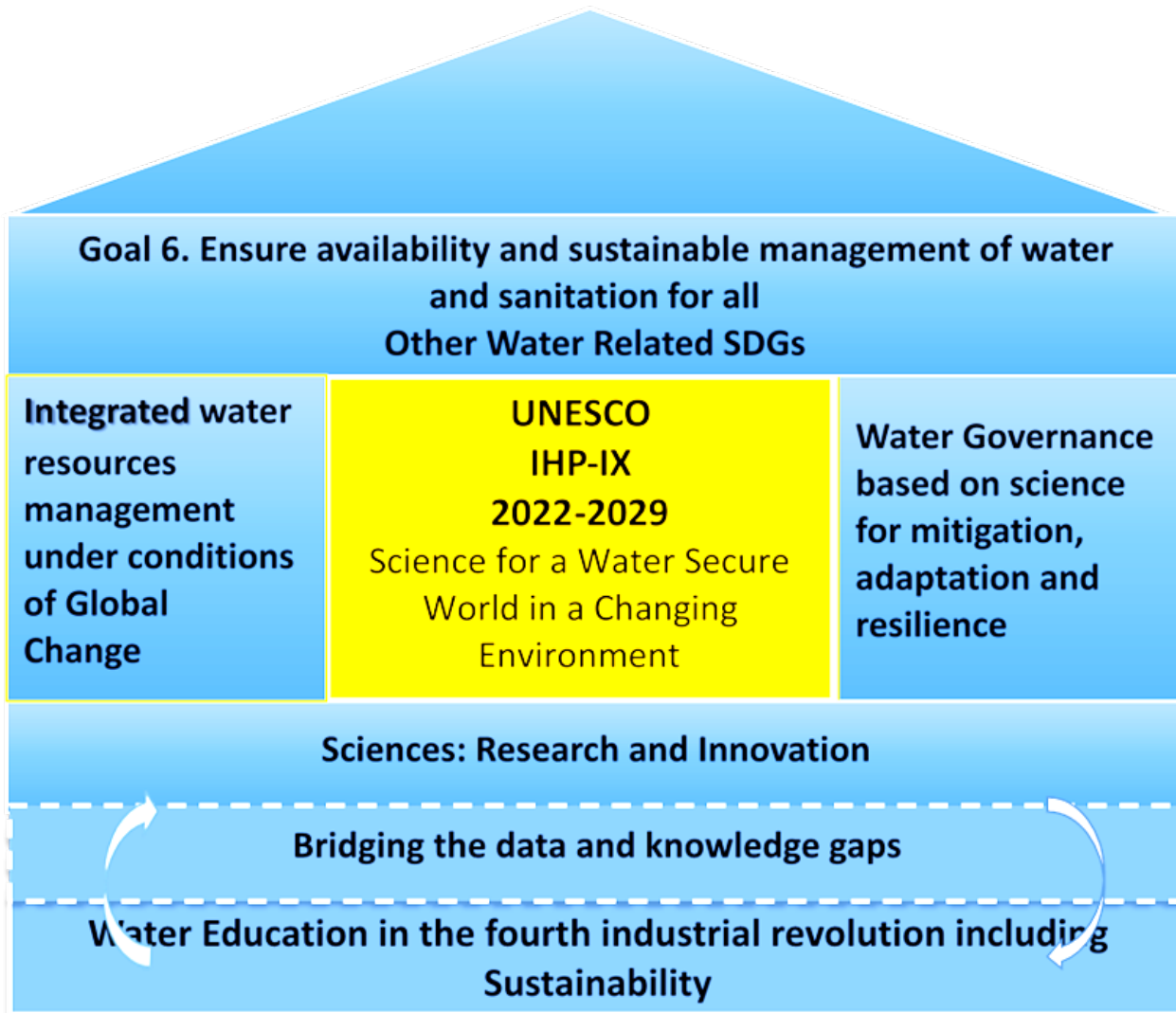


*\*WWDR 2022, Figure 11.1 Pollution sources that threaten groundwater quality*

**Groundwater pollution is a virtually irreversible process**

# IHP IX 2022-2029

## Science for a Water Secure World in a Changing Environment



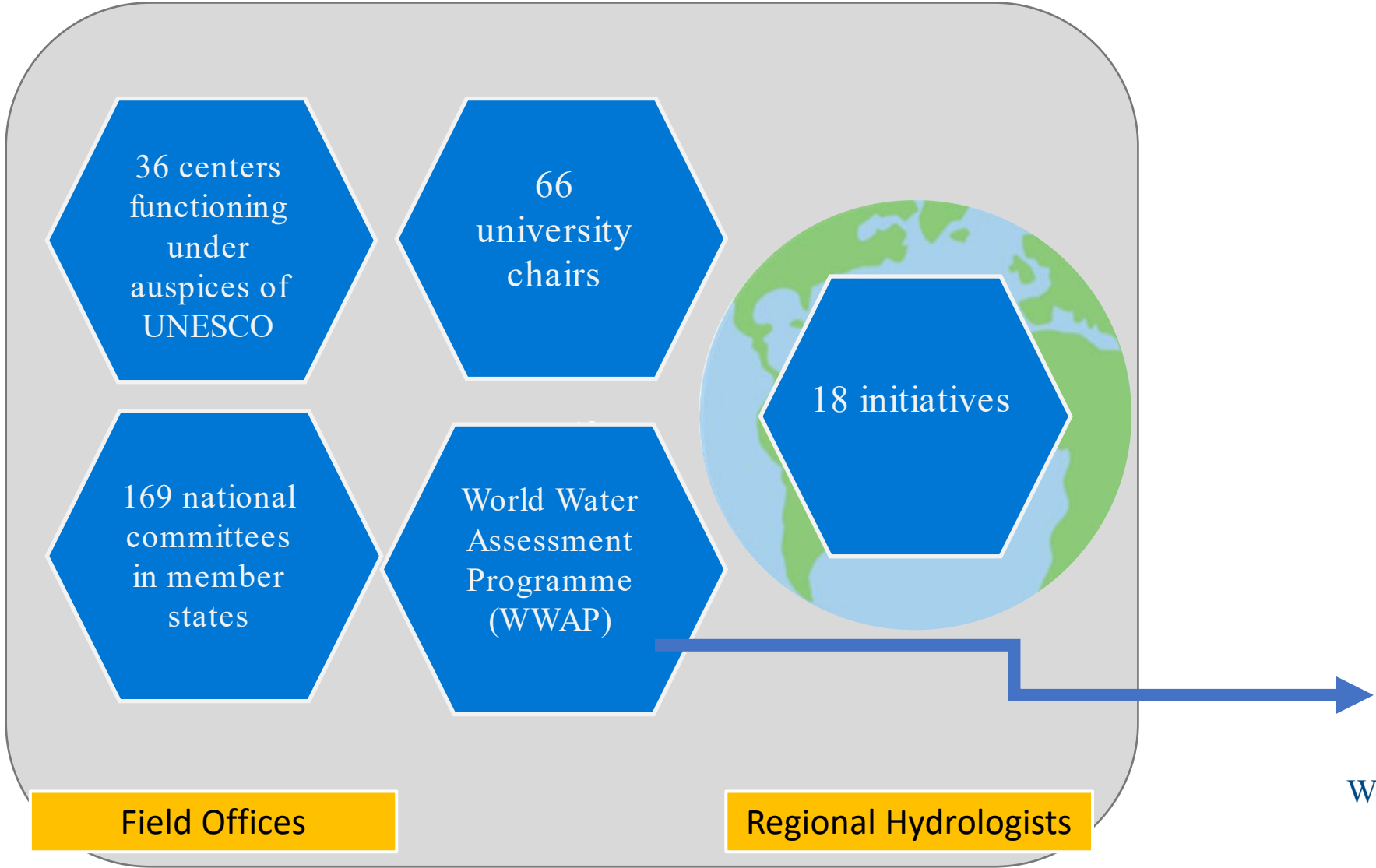
### Five priority areas:

- Scientific research and innovation
- **Water Education** in the Fourth Industrial Revolution including Sustainability
- Bridging the **data-knowledge gap**
- Integrated **water resources management** under conditions of global change
- Water Governance based on science for mitigation, **adaptation and resilience**

**34** expected outputs

**150** Key activities (draft implementation Plan)

# The UNESCO water family will be mobilized in implementing IHP-IX



Annual report produced by World Water Assessment Programme on different themes

# Groundwater sustainability and water cooperation: Summary description and key activities

## KEY ACTIVITIES

- Preparation and undertaking of the 3rd SDG indicator 6.5.2 reporting on transboundary water cooperation (**IMI initiative, 140 Member States**)
- Development of technical tools for science-based groundwater resources management in transboundary aquifers (**GGRETA, 6 Member States**)
- Enabling implementation of the Regional Strategic Action Programme (SAP) of the **Nubian Sandstone Aquifer System (4 Member States)**
- Support AMCOW's APAGROP initiative (**Groundwater in Africa**)

## SUMMARY DESCRIPTION



Support MS in improving **TB aquifers assessments, management and governance**



Promote **Water Cooperation**



Develop and disseminate **knowledge products** on Groundwater and Water Cooperation



**Build capacity** of MS on water cooperation and groundwater

- Increase knowledge on coastal aquifers and submarine groundwater discharge and their management in the Mediterranean Region. (**MED, 8 Member States**).
- Formulation of a governance mechanism for the conjunctive management of surface water and groundwater (**ITTAS, 11 Beneficiary countries in North, West and Central Africa**)

# MED Programme: component on management of coastal aquifers and related ecosystems

- Joint regional training modules on conjunctive surface and groundwater management
- National Assessment of Submarine Groundwater Discharges
- Preparation of Management Plans for 5 pilot aquifers

Main Mediterranean coastal aquifers and representative wetlands assessed by UNESCO-IHP for the MedPartnership



Groundwater resources and recharge (mm/year) (Source: WHYMAP)



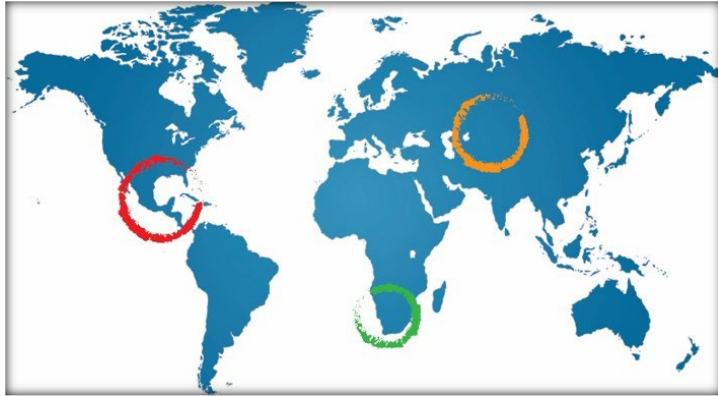
Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem  
**MedPartnership**

Together for the Mediterranean Sea



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# GGRETA: Governance of Groundwater Resources in Transboundary Aquifers



## In 3 Transboundary Aquifers:

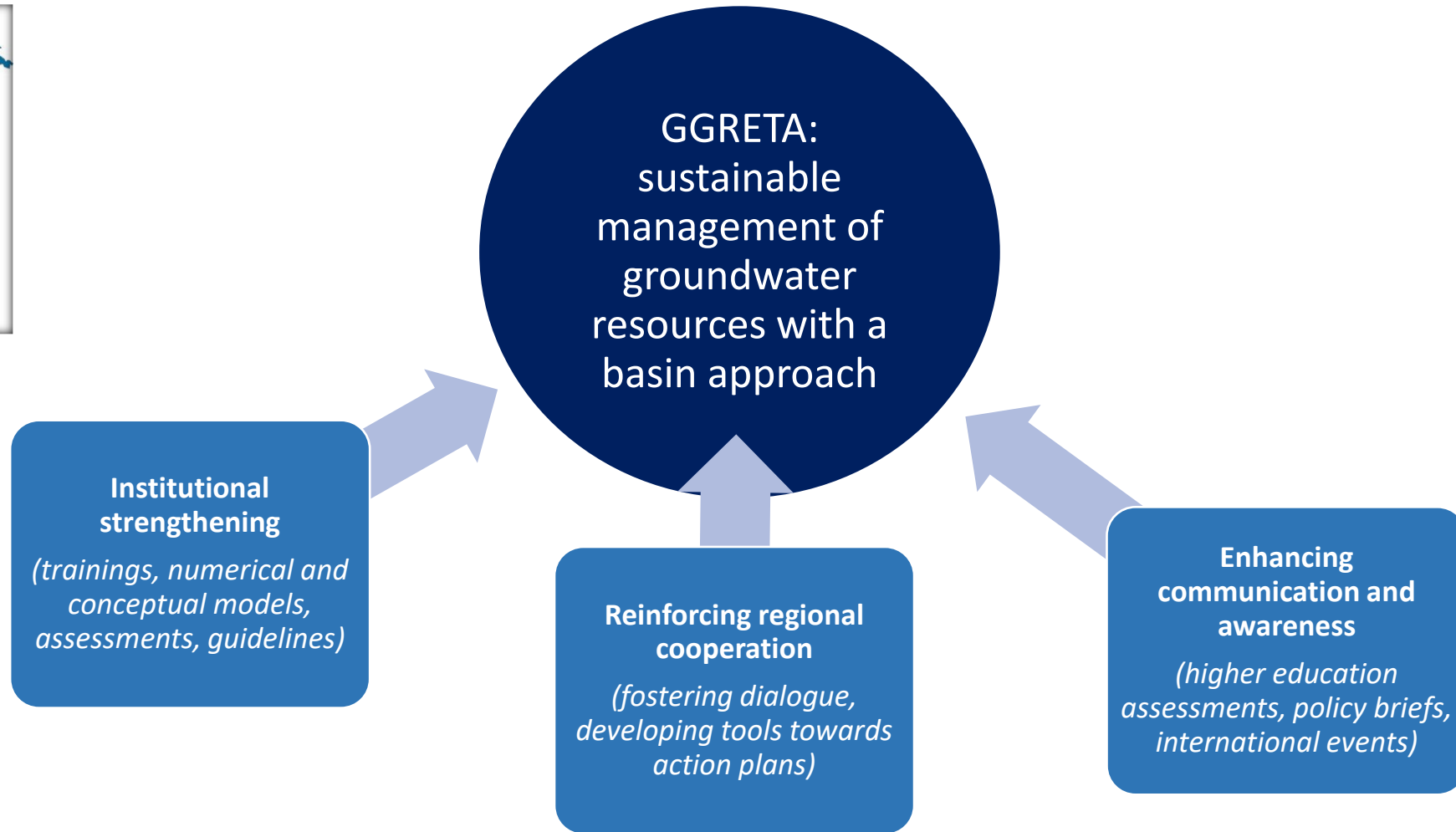
- Stampriet (Southern Africa)
- Pretashkent (Central Asia)
- Ocatepeque-Citala (Central America)

## Project funded by:

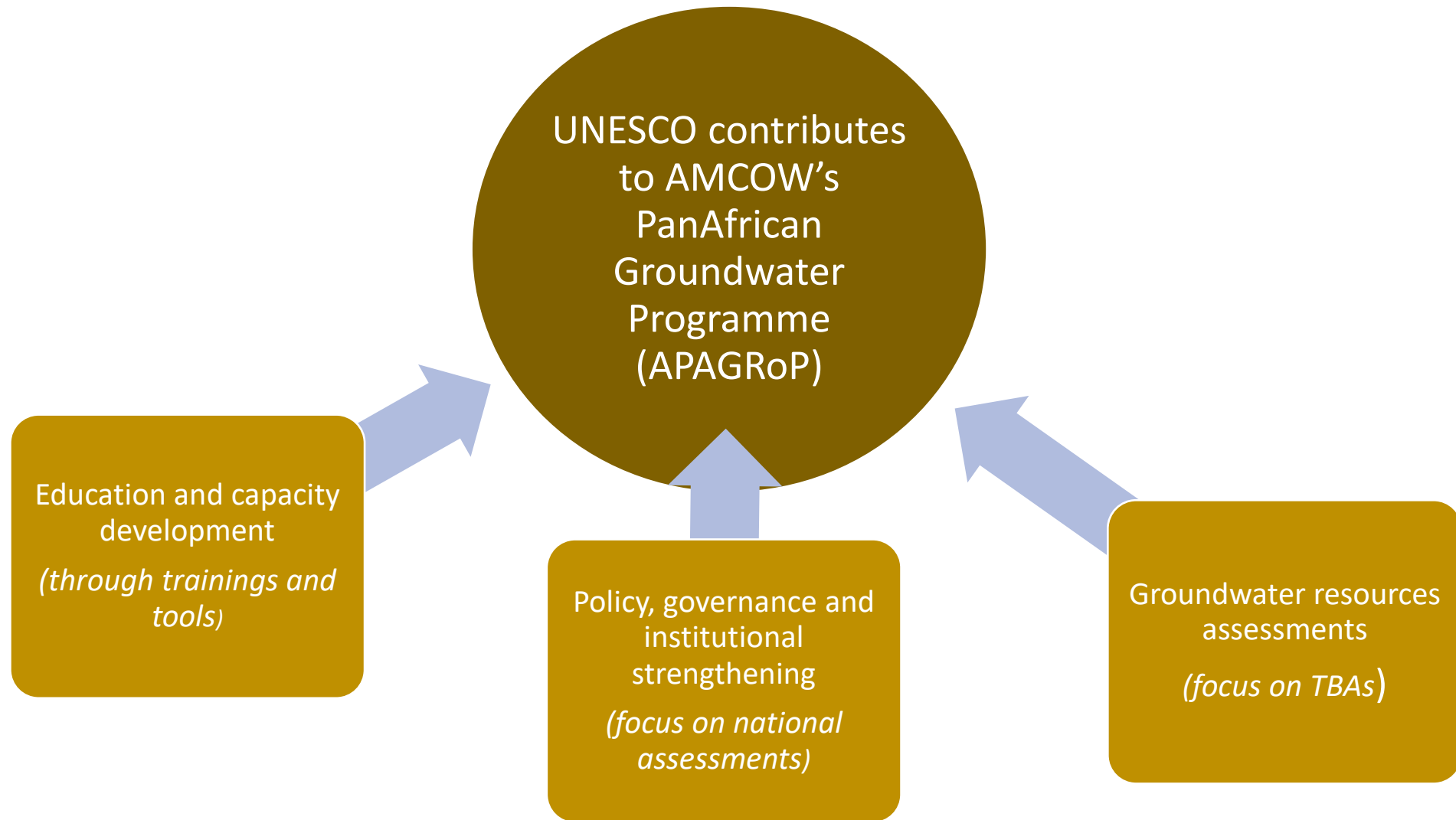


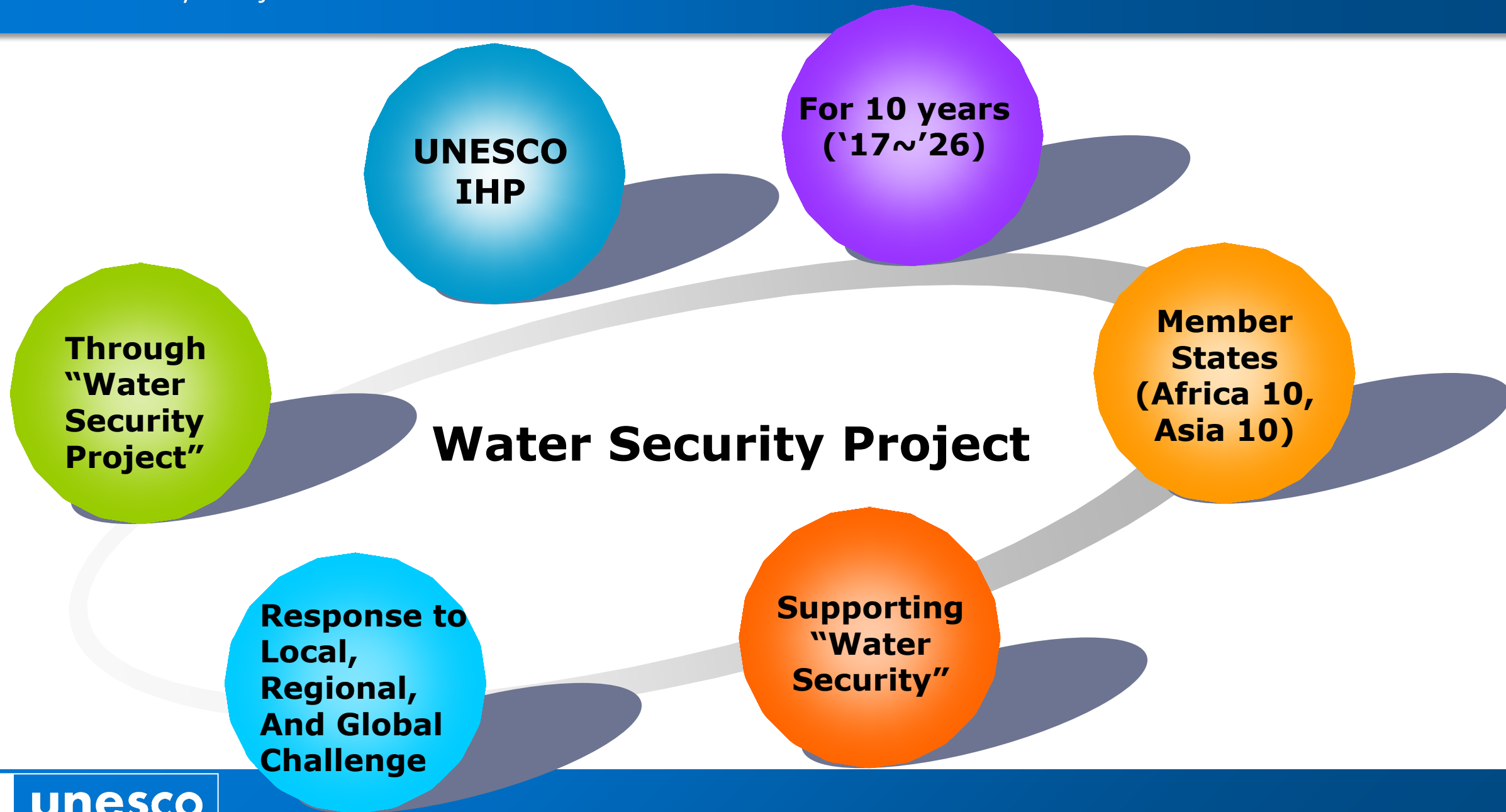
Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Agency for Development  
and Cooperation SDC



# In Africa: Cooperation with African Ministers' Council of Water (AMCOW)



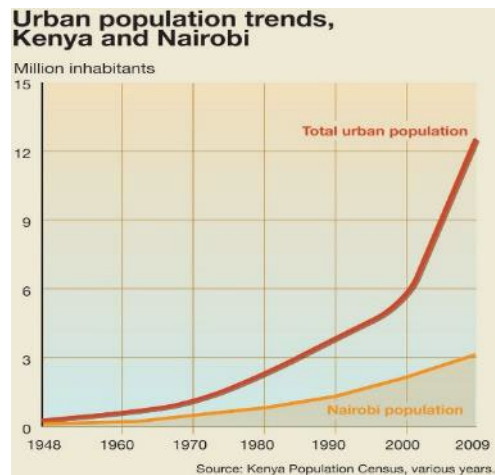




# Kenya

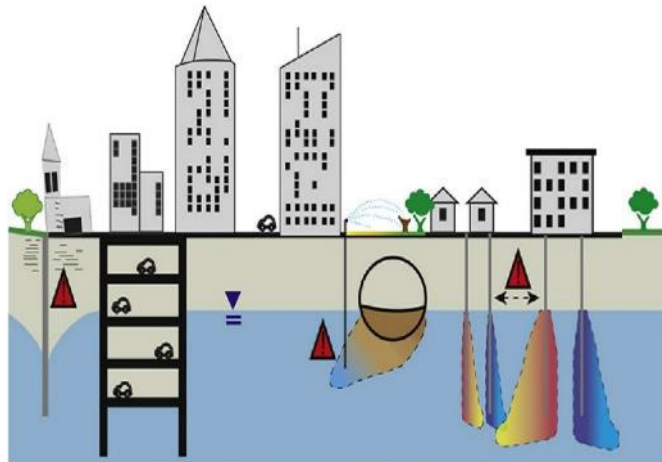
## ✓ Urban water Issues

- Highly population growth rate : annually 3% ('99~'09)
- Highly GDP growth rate (6.1%, 2012 and expected to maintain until 2030) (Kenya water master plan, 2013)
- Populations concentrate in urban area
- Increasing demand for clean and safe water



[ Urban Pop. trends ]

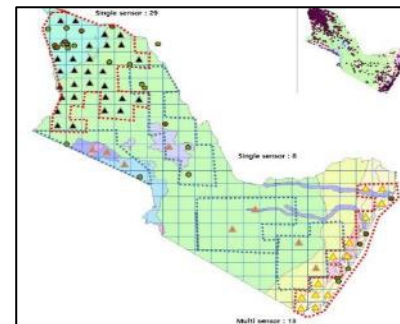
( — Nairobi — Total Urban )



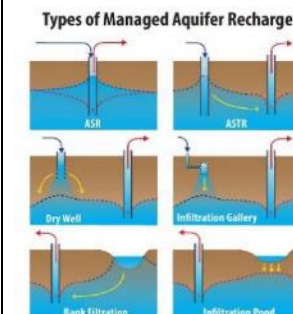
[ Urbanization, water demand high ]  
(Vulnerability of GW contamination)

## ✓ Water Security Project

- **Implementation Status** : On going (Launched 2019)
- **Title** : Improvement of groundwater management and recharge of treated water in Nairobi
- **Implementing** : HQ, Nairobi Office, C2C (RCGR, i-WSSM)
- **Expected results**
  - Develop Guidelines for Groundwater Management for the City of Nairobi
  - Enhance the capacity of management for groundwater monitoring network established



[ GW monitoring system Propose ]



[ GW Recharge method propose ]



[ Invitation & Capacity building ]



## ✓ Urban water Issues

- Half of the capital city's populations rely on Dili unconfined aquifer (over extraction of groundwater)
- Water distribution with minimal or no treatment, and with no systematic monitoring of quality
- Need to scientific management of Freshwater for clean and sustainable water usage



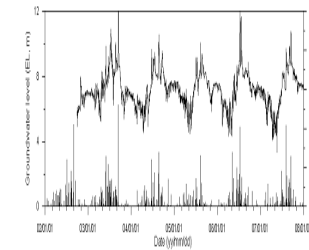
[ GW Contamination,  
Seawater intrusion ]



[ Climate Change :  
Flooding (April, 2021) ]

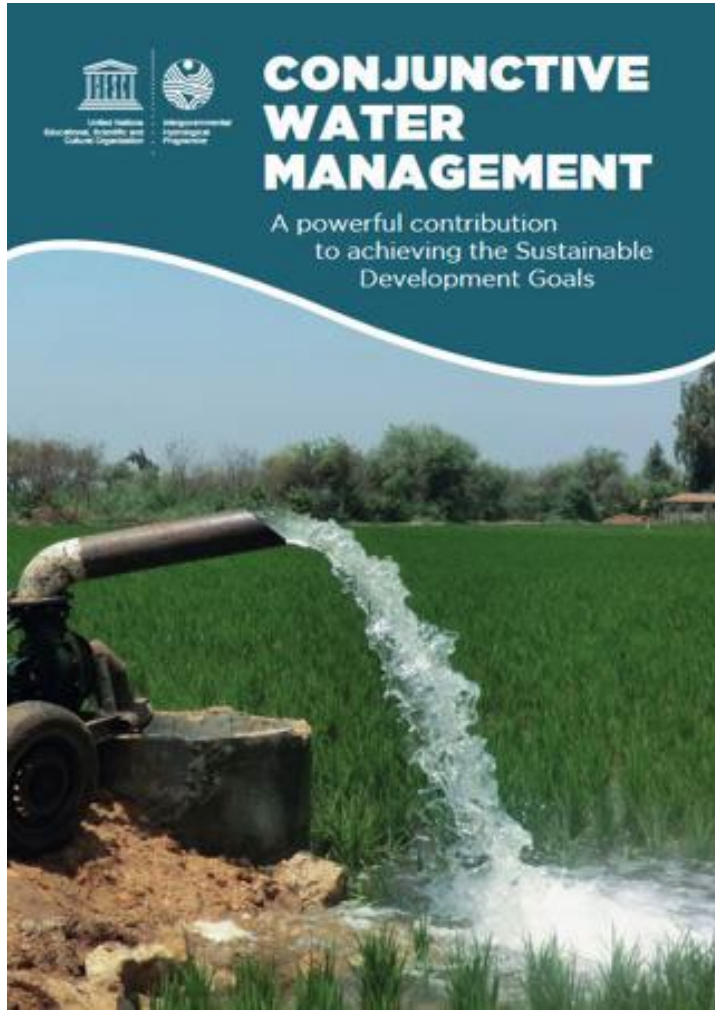
## ✓ Water Security Project

- **Implementation Status** : Final review before Launching
- **Title** : Installation Groundwater monitoring and management capacity building
- **Implementing** : HQ, Jakarta Office, i-WSSM
- **Expected results**
  - Install the GW monitoring and Enhance the capacity of management for groundwater monitoring network
  - Enhance the capacity of local technicians, practitioners responsible for urban groundwater management.



[ Invitation &  
Capacity building ]

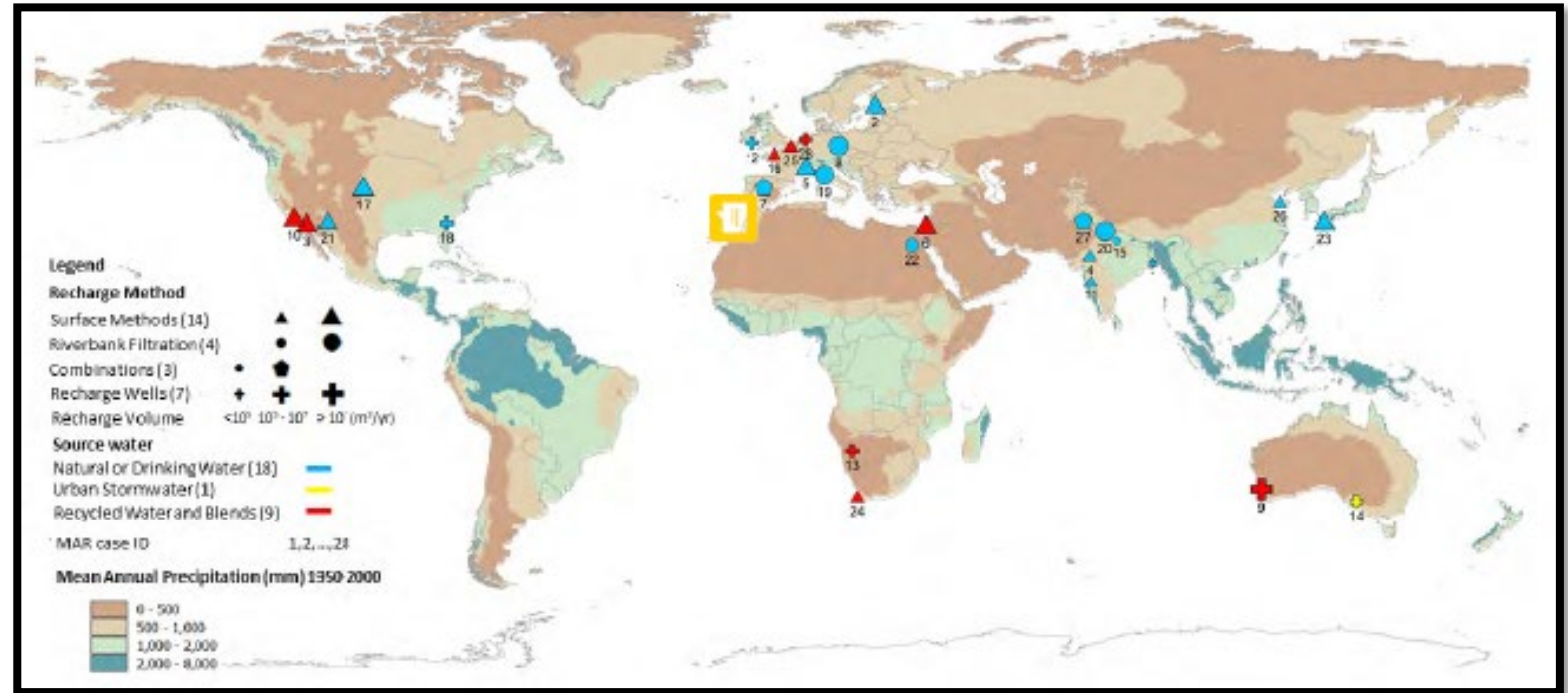
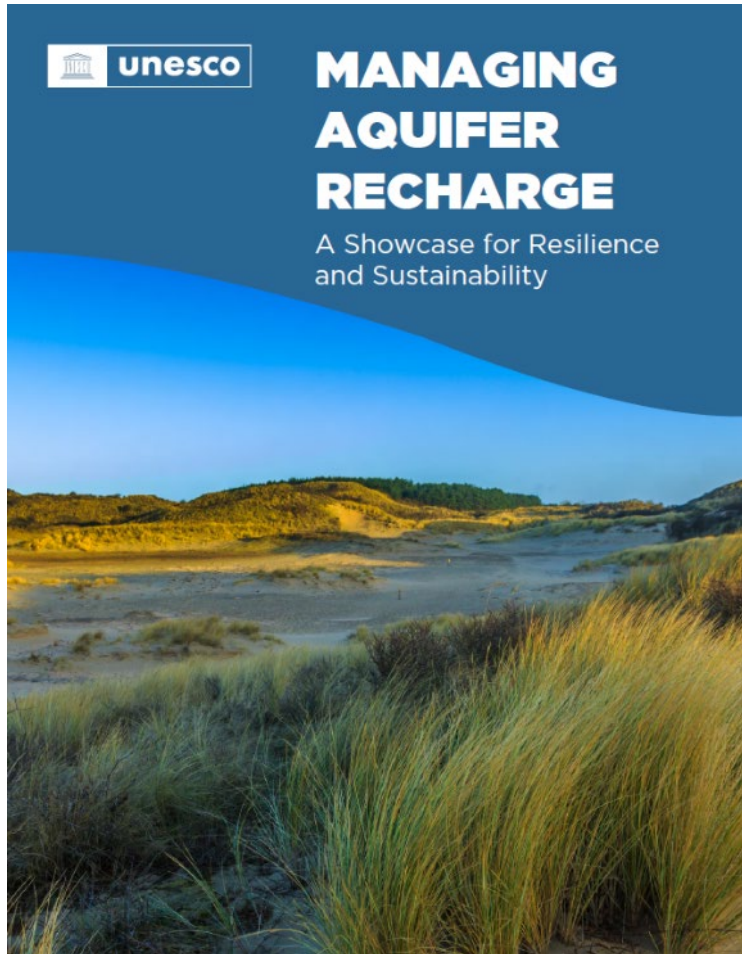
[ Groundwater monitoring  
well Installation ]



- **Intended as** an introduction to joint management of surface and groundwater resources.
- **General objective:** familiarizing the reader with the concept of conjunctive water management.
- **Aimed at** water resources decision-makers, policy-makers and planners.

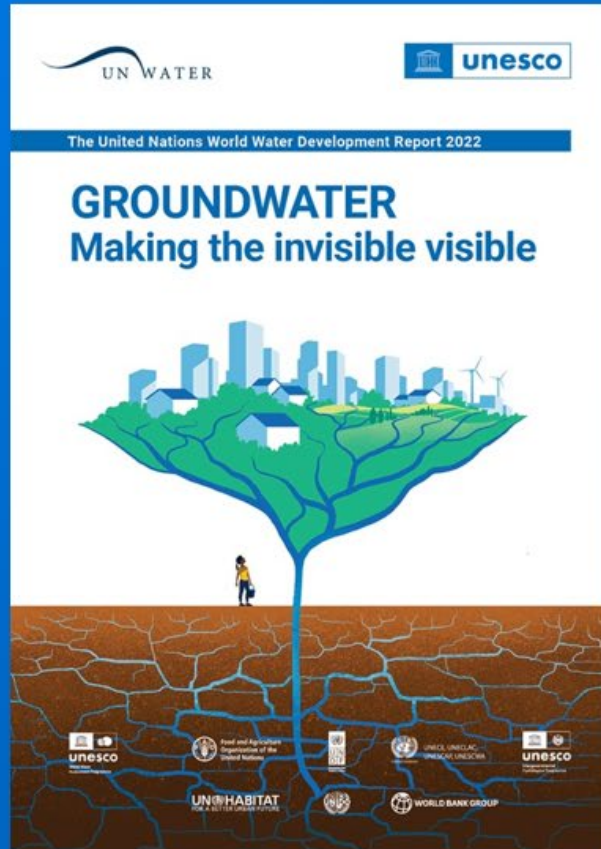
Available at:

<https://unesdoc.unesco.org/ark:/48223/pf0000375026>



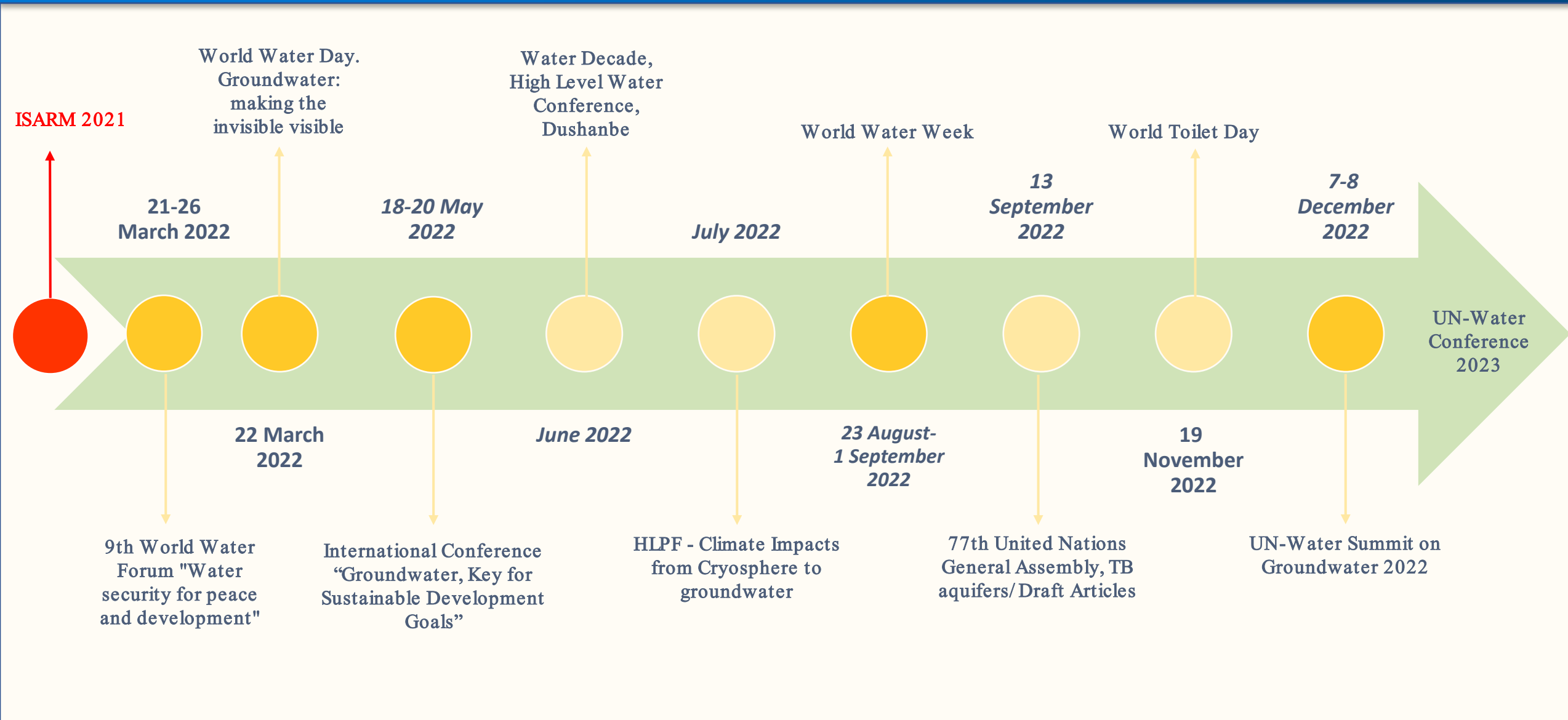
Zheng, Y., Ross, A., Villholth, K.G. and Dillon, P. (eds.), 2021. Managing Aquifer Recharge: A Showcase for Resilience and Sustainability. Paris, UNESCO.

<https://unesdoc.unesco.org/ark:/48223/pf0000379962>





# Groundwater: Making the invisible visible in 2022 and beyond



# Groundwater Summit: 7-8 December 2022 at UNESCO Headquarters - Paris

The **UN-Water Summit on Groundwater** will take place on 7<sup>th</sup> and 8<sup>th</sup> December 2022 at UNESCO HQs, Paris. The 6<sup>th</sup> December will be a **Pre-Summit** day, devoted to side-events only.

The Summit will use as baseline the **World Water Development Report 2022** focused on Groundwater, and the **SDG 6 Global Acceleration Framework** as a guideline to define actions towards more **responsible and sustainable use and protection of this vital natural resource**.

## PROGRAMME DETAILS

- Opening session
- 5 Sessions on groundwater and SDG6 accelerators
- 5 Thematic sessions
- Closing Session
- Side Events

More details and registration at :  
[www.groundwater-summit.org](http://www.groundwater-summit.org).

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UN WATER

igrac  
International Groundwater Resources Assessment Centre

# SAVE THE DATE

## UN-Water Summit on Groundwater

**6**  
December  
**2022**  
Pre-Summit  
Side-Events

The UN-Water Summit on Groundwater organized by UNESCO and its International Groundwater Resources Assessment Centre (IGRAC) on 7-8 December 2022 in UNESCO HQ, Paris, will be the culminating event of this special year about groundwater. The Summit aims to make groundwater more visible in order to better manage and protect it. It will unify the statements from all major water-related events in 2022 in one comprehensive groundwater message for the UN Water Conference 2023.

**7-8**  
December  
**2022**  
Summit on  
Groundwater

# UN SDG6 Global Acceleraton Framework

**UNESCO Water family is a key partner:**

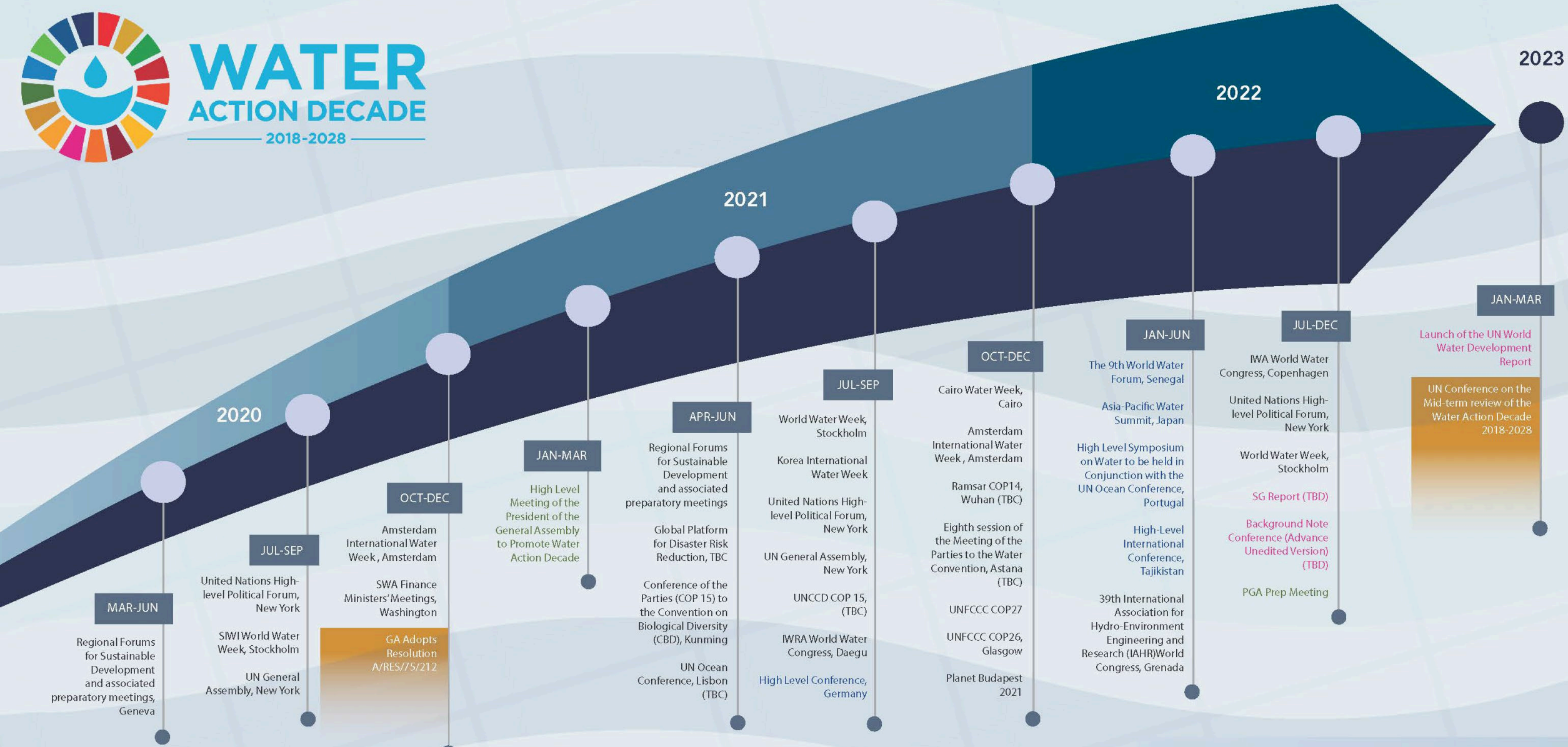


UNESCO's Contribution to  
the **Water and Climate Coalition**,  
hosted by WMO for SDG6 Implementation

# ROAD MAP TO MID-TERM REVIEW OF THE UN WATER ACTION DECADE— MARCH 2023



**WATER**  
ACTION DECADE  
2018-2028



2020

2021

2022

2023

MAR-JUN

Regional Forums for Sustainable Development and associated preparatory meetings, Geneva

JUL-SEP

United Nations High-level Political Forum, New York  
SWI World Water Week, Stockholm  
UN General Assembly, New York

OCT-DEC

Amsterdam International Water Week, Amsterdam  
SWA Finance Ministers' Meetings, Washington  
GA Adopts Resolution A/RES/75/212

JAN-MAR

High Level Meeting of the President of the General Assembly to Promote Water Action Decade

APR-JUN

Regional Forums for Sustainable Development and associated preparatory meetings  
Global Platform for Disaster Risk Reduction, TBC  
Conference of the Parties (COP 15) to the Convention on Biological Diversity (CBD), Kunming  
UN Ocean Conference, Lisbon (TBC)

JUL-SEP

World Water Week, Stockholm  
Korea International Water Week  
United Nations High-level Political Forum, New York  
UN General Assembly, New York  
UNCCD COP 15, (TBC)  
IWR World Water Congress, Daegu  
High Level Conference, Germany

OCT-DEC

Cairo Water Week, Cairo  
Amsterdam International Water Week, Amsterdam  
Ramsar COP14, Wuhan (TBC)  
Eighth session of the Meeting of the Parties to the Water Convention, Astana (TBC)  
UNFCCC COP27  
UNFCCC COP26, Glasgow  
Planet Budapest 2021

JAN-JUN

The 9th World Water Forum, Senegal  
Asia-Pacific Water Summit, Japan  
High Level Symposium on Water to be held in Conjunction with the UN Ocean Conference, Portugal  
High-Level International Conference, Tajikistan  
39th International Association for Hydro-Environment Engineering and Research (IAHR) World Congress, Grenada

JUL-DEC

IWA World Water Congress, Copenhagen  
United Nations High-level Political Forum, New York  
World Water Week, Stockholm  
SG Report (TBD)  
Background Note Conference (Advance Unedited Version) (TBD)  
PGA Prep Meeting

JAN-MAR

Launch of the UN World Water Development Report

UN Conference on the Mid-term review of the Water Action Decade 2018-2028

*Thank you!*



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