

Water in human settlements

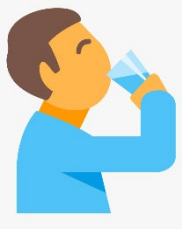
UNESCO Intergovernmental Hydrological Programme promoting science,
research and education



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Global water challenges



2 billion people lack access to safely managed drinking water, including 1.2 billion people lacking a basic level of service.

2 billion people lack basic sanitation.



Water pollution is worsening worldwide with eutrophication due to **untreated sewage discharges** and **nutrient runoff** from agriculture, **emerging pollutants**, **plastic and microplastic pollution**



Food security are at risk due to water scarcity versus growing water demands for more food production



Water-related disasters are increasing in intensity and frequency due to climate change, with 90% of natural disasters being water-related.



Significant future **reductions in renewable water** will affect the quantity, quality and reliability of water resources



Competing water uses are exacerbated at the local, regional and global levels with potential conflicts between different users

Water in cities

Cities share common issues and challenges related to water :

- Safe drinking water



- Wastewater & water pollution



- Water-related disasters (floods, drought)



- Urban aquatic ecosystem health



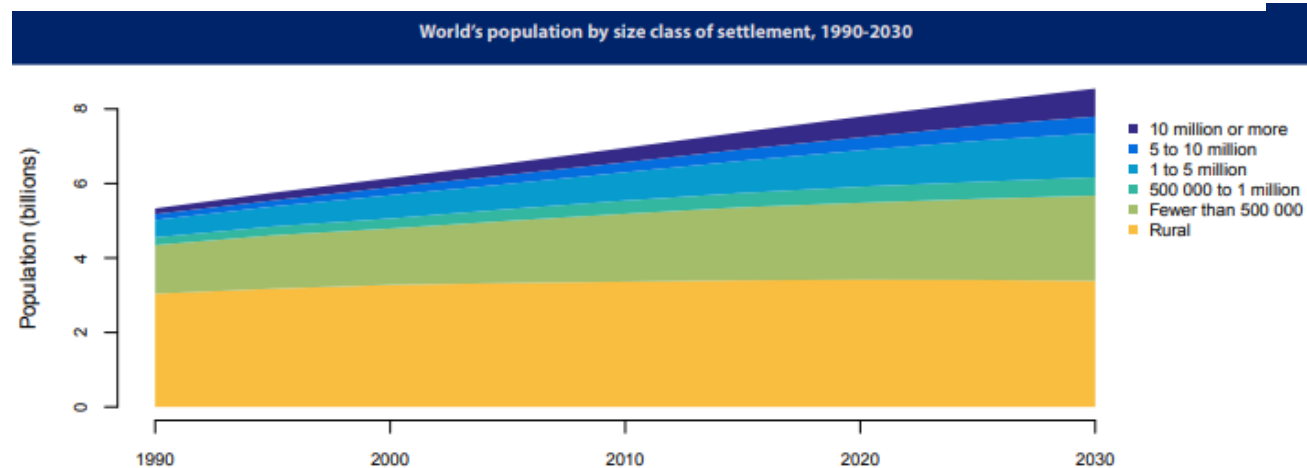
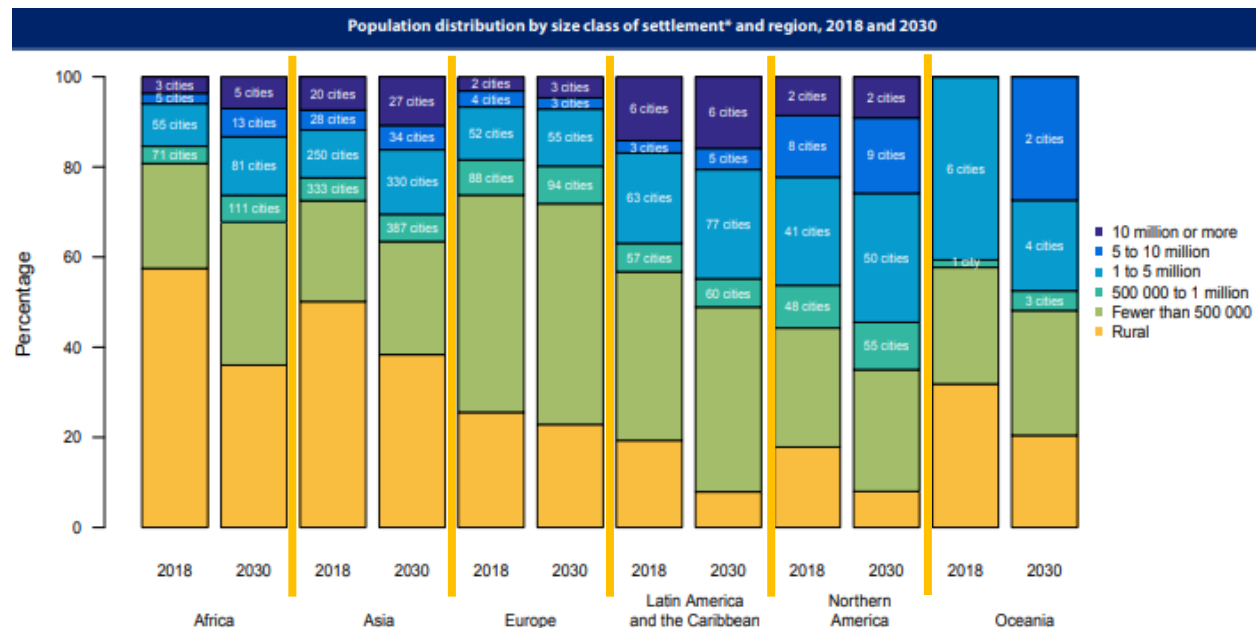
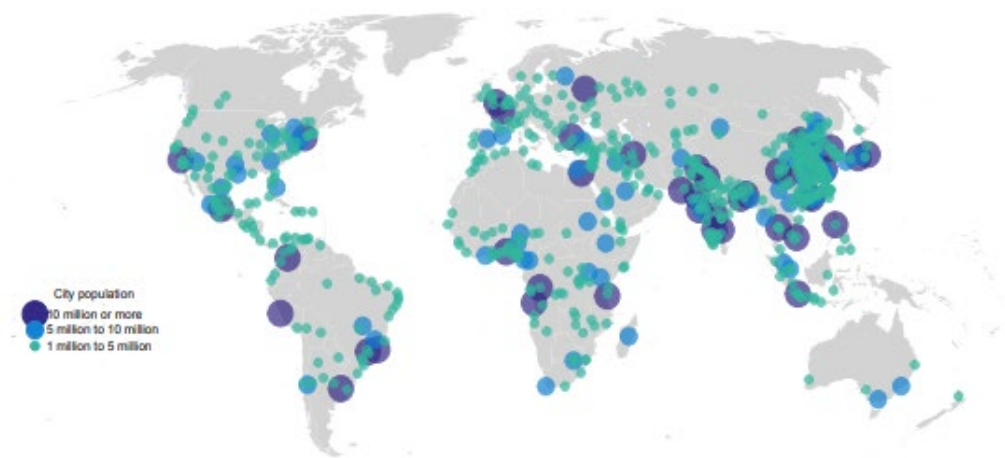
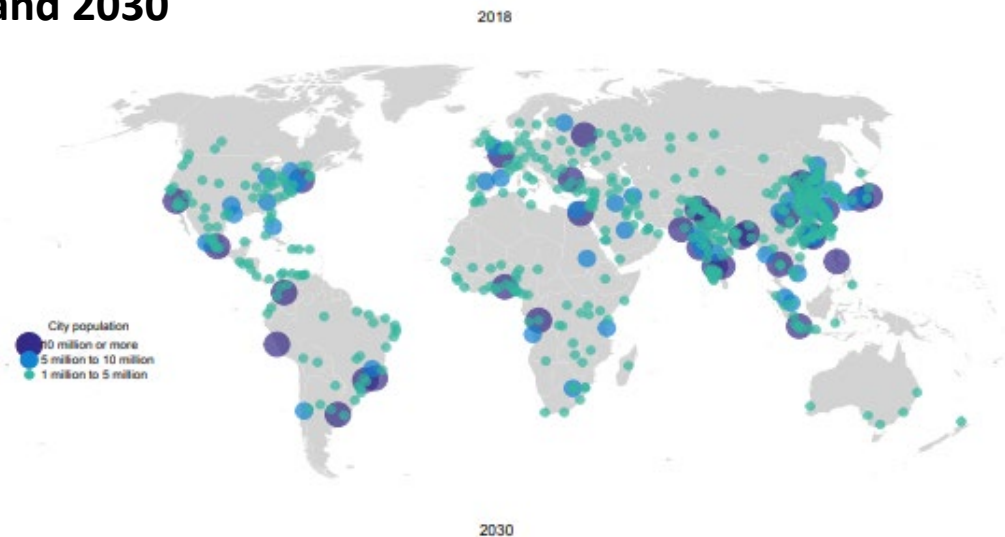
By **2030**, over **one billion** people will be living in approximately **100 very large cities**



Estimations indicate that **60 %** of the **world's population** will be living in **urban areas by 2030**

Key figures on cities and megacities

Cities with 1 million in habitants of more, 2018 and 2030



Global urban agendas



SDG 6 Ensure access to **water** and **sanitation** for all
SDG 11 Sustainable cities - Target 11.5: Reduce the adverse effects of **natural disasters**



“We envisage **cities** and **human settlements** that **protect, conserve, restore** and **promote water**”



“**Promote** the **resilience** of critical **infrastructure**, including **water**, to ensure that they remain **safe, effective** and **operational** during and after **disasters**”



“Sustainable **urban water** management” was identified in the **IPCC-6** as major **Climate responses** and **adaptation options** to Key **Risks of climate change**



UNESCO IHP activities on urban water



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Intergovernmental
Hydrological Programme

IHP-IX: Science for a water secure world in a changing environment

IHP VISION

IHP envisions a **water secure world** where people and institutions have **adequate capacity** and scientifically based knowledge for **informed decision-making** on water management and governance.

IHP-IX MISSION

Our mission for the period 2022-2029 is to **support the Member States** to accelerate the **implementation of water-related SDGs** and other relevant agendas through water science and education.

PRIORITY AREAS

- 1. Scientific Research and innovation**
- 2. Water education** in the Fourth Industrial Revolution including Sustainability
- 3. Bridging the data-knowledge gap**
- 4. Integrated water management** under conditions of global change
- 5. Water governance based on science** for mitigation, adaptation, and resilience

IHP IX: Science for a water secure world in a changing environment

“Strategic Plan of the Intergovernmental Hydrological Programme”

EXPECTED OUTPUTS

Each of the **34 expected outputs** listed in this table includes several key activities composing the **Operational Implementation Plan** (with a total of **150 key activities**)

Priority Area 1	Priority Area 2	Priority Area 3	Priority Area 4	Priority Area 5
Scientific Research and innovation	Water education in the Fourth Industrial Revolution including Sustainability	Bridging the data-knowledge gap	Integrated water management under conditions of global change	Water governance based on science for mitigation, adaptation, and resilience
1.1 International scientific cooperation in hydrology	2.1 Raising public’s awareness about the multi-functions of water	3.1 Methods to collect, analyze, interpret and exchange data	4.1 inclusive and participatory approaches by the scientists	5.1 Awareness on the importance of science-based water governance
1.2 Ecohydrology research and innovation	2.2 Transdisciplinary collaborations and educational approaches	3.2 Establishment of harmonized experimental basins	4.2 Research on upstream-downstream river uses	5.2 Integration of sound science in water governance instruments
1.3 Research on uncertainty in climatic scenarios	2.3 Teaching and learning materials on water-related matters	3.3 Comparing and validating open access data on water	4.3 Research on non-conventional Water Resources (circular eco.)	5.3 Strengthening water-based climate policy-action nexus
1.4 New business models and circular economy in urban water	2.4 Methods and tools based on new practices by scientists	3.4 Scientific tools for data processing (Cities network, i.e., MAWaC)	4.4 Using the source-to-sea and nexus approaches	5.4 Adaptive water management to enhance sound water governance
1.5 Assessments on the interaction between humans and water	2.5 Identify the main gaps for sustainable water management		4.5 Pollutants sources, fate and transport in freshwater systems	5.5 New tools to underpin water governance and build resilience
1.6 water-related disasters’ knowledge, methodologies, tools	2.6 Capacities of decision makers, water managers, water institutions		4.6 Assessment of ecosystem services and environmental flows	
1.7 Impacts of global changes on human settlements			4.7 Methods to monitor changes in the cryosphere system	
1.8 Improving water quality in urban water/ecosystem			4.8 Mainstreaming global changes within urban water management	
1.9 New technologies i.e. Smart water management systems			4.9 Implementing integrated water resources management	
1.10 integrating citizen science in the hydrological discipline				

IHP-IX Focus areas related to urban water

IHP-IX Outputs related to urban water:

- **Circular economy** in urban water management and water reuse (1.4, 4.3, 4.4) – *A session at the Stockholm World Water Week*
- **Resilient cities:** Water and climate in cities under global changes (1.8, 4.3, 5.2)
- **Nature-based solutions** in urban water management (1.8, 2.6, 4.3)
- Water quality and pollution in **urban aquatic ecosystems** (1.8, 1.9)
- **Source-to-sea and nexus approaches** in urban water management (4.4)
- **Urban water governance** (4.8, 5.2)
- **Science-based policy development** for adaptive urban water management (1.7, 5.4)
- **Integration of sound science in water management and governance** (5.2, 5.4)

Ongoing activities/projects:

1. **City Blueprint Framework** (CBF) (4.8, 5.2)
2. **Environmental Coastal coOperation** for **Metropolitan Eco-sustainable Development** (ECOMED) (1.7, 1.8, 4.8)
3. **Megacities Alliance for Water and Climate** (MAWaC) (3.4, 4.3, 5.2)
4. **Urban water** management in the **Balkans** region (1.7, 4.8, 5.4)
5. **Water security** in human settlements under climate change (4.3)

EauMega Conference 2022

This conference followed years of **events stressing the importance of water**, and the effects that **climate change** has both in **rural** and **urban areas**. Two months before the World Water Forum in Dakar, it allowed a large panel of stakeholders from the water field to update on the **current and most pressing issues**.

Conference **key figures**



100+ scientific **papers**



250+ **speakers**



2,000+ **participants**



8,000+ **people reached**
daily on Twitter

12 thematic sessions tackled the following **topics**:

- Knowledge of Technical and Social Conditions
- Strengthening of Sustainable Solidarities
- Technical and Technological Solutions
- Evolution since 2021 pre-conference
- Service Continuity and SDGs
- Holistic Water Management
- Planning Tools
- New Water Culture
- Innovative Initiatives
- Disaster Risk Reduction
- Governance Modalities
- Land Issues and Challenges



Megacities Alliance for Water and Climate

WATER, MEGACITIES
AND GLOBAL CHANGE

The Megacities Alliance for Water and Climate (**MAWaC**) aims to provide an international **cooperation forum** for **dialogue** on water to help megacities **adapt** to and **mitigate** the effects of **climate change**. It involves all stakeholders in the water sector such as governance leaders, civil society, researchers, decision makers and utilities.

Objectives of the alliance



Facilitate **experience sharing**



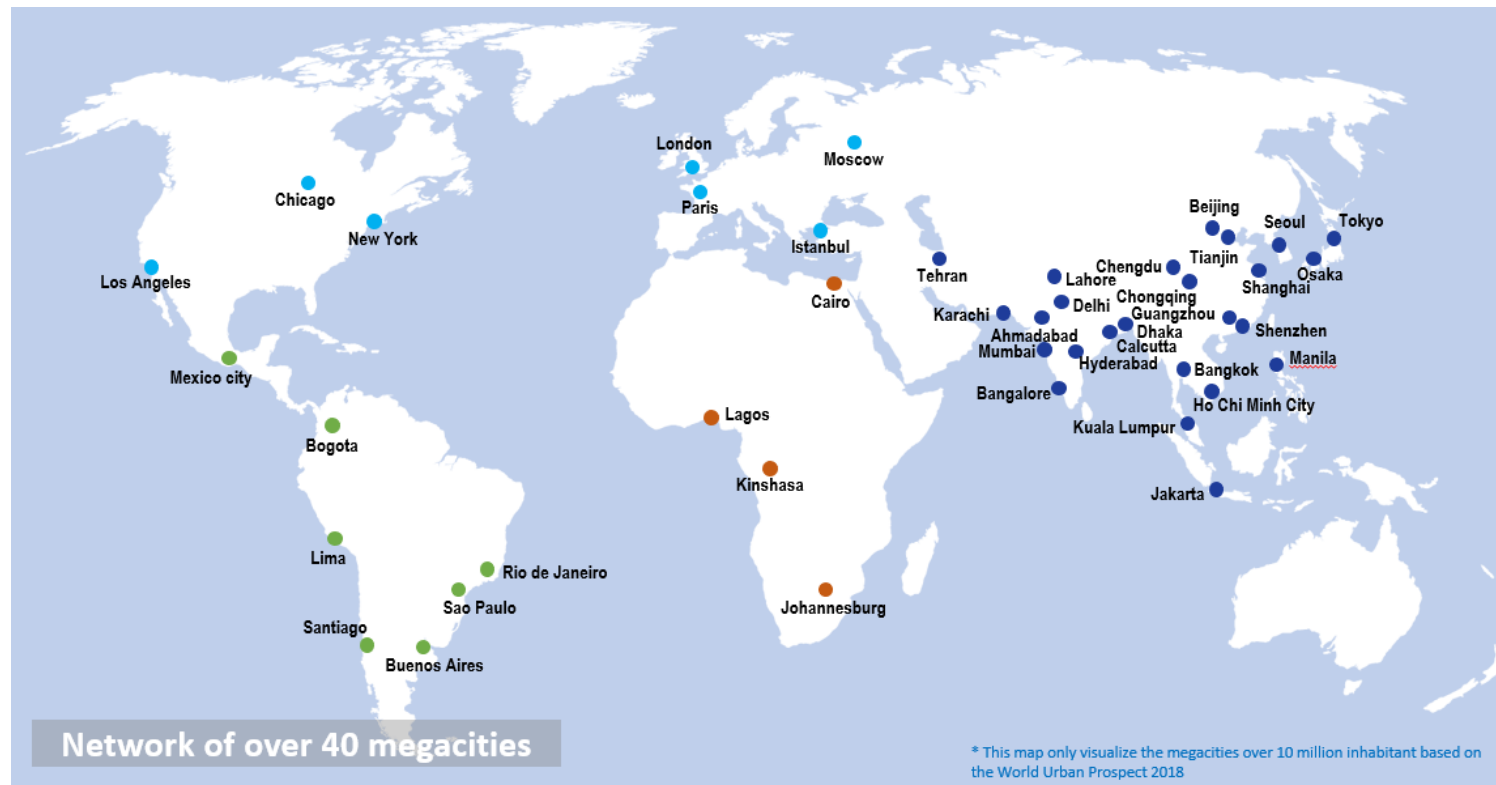
Strengthen the governance of **water resources management**



Build the **knowledge base** on water and climate issues



Identify means and **mechanisms for funding**



Megacities vulnerability, adaptation and resilience to climate change

The impact of climate change on megacities requires adaptation measures and transformations to avoid potential crises

Mitigation

- Reducing the carbon footprint
- Recovering resources: energy, gas, nitrogen and phosphorus

Adapting to the risk of flooding

- Preventive initiatives
- Risk management measures

Adapting to the risk of drought

- Managing demand and saving water
- Reusing wastewater

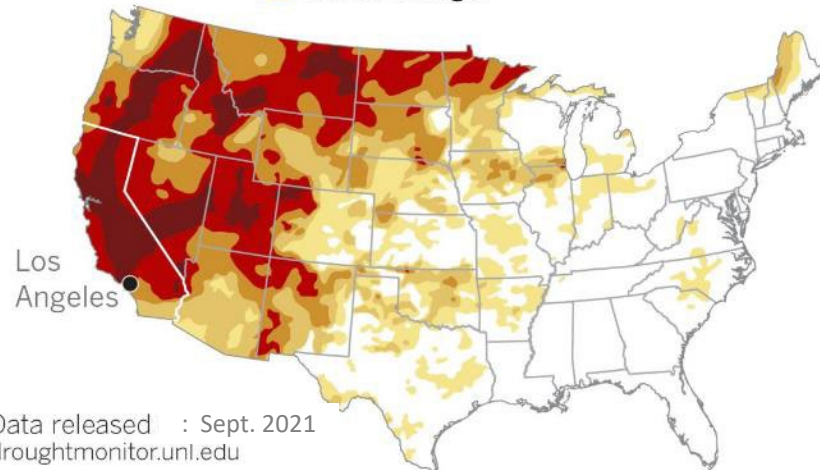
Adapting to other risks

- Risk of rising sea levels, erosion and salination
- Changes in temperatures and precipitation
- One-off risks

Resilience

- Climate resilient water supplies
- Infrastructure resilience
- Efficient DRR frameworks

U.S. drought conditions



Data released : Sept. 2021
droughtmonitor.unl.edu

Deadliest floods in Europe

In the last 20 years



*Provisional toll July 17 at 0800 GMT. Netherlands and Luxembourg also affected by flooding





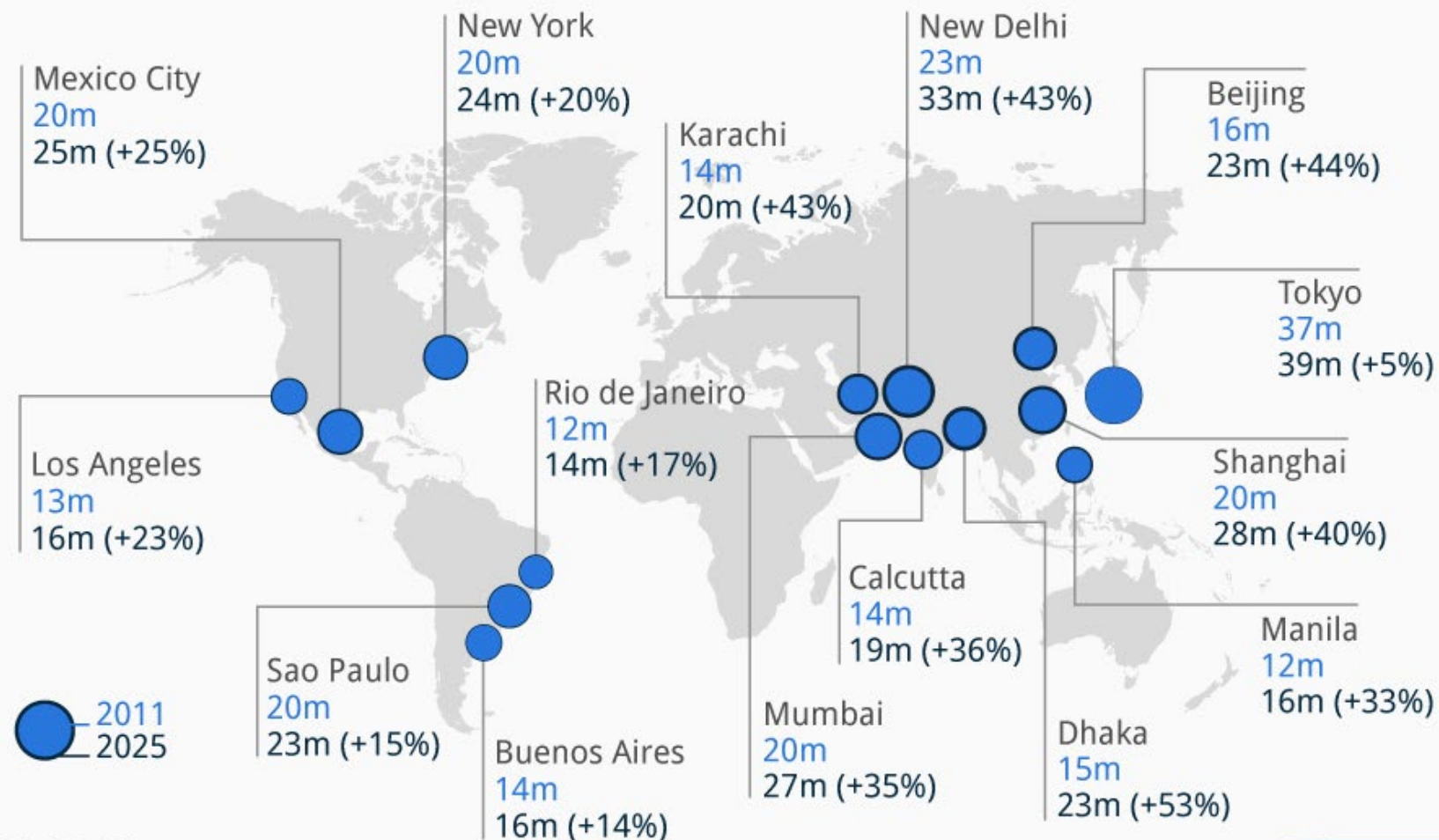
The **38 megacities** identified by UNDESA in 2018 represent **595 millions inhabitants**

MEGACITIES



The World's Megacities Are Set for Major Growth

Population growth of the world's top 15 megacities (millions, 2011-2025)



@StatistaCharts

* including metropolitan areas
 Source: UN Population Division, World Economic Forum



Water management in cities: City Blueprint Framework

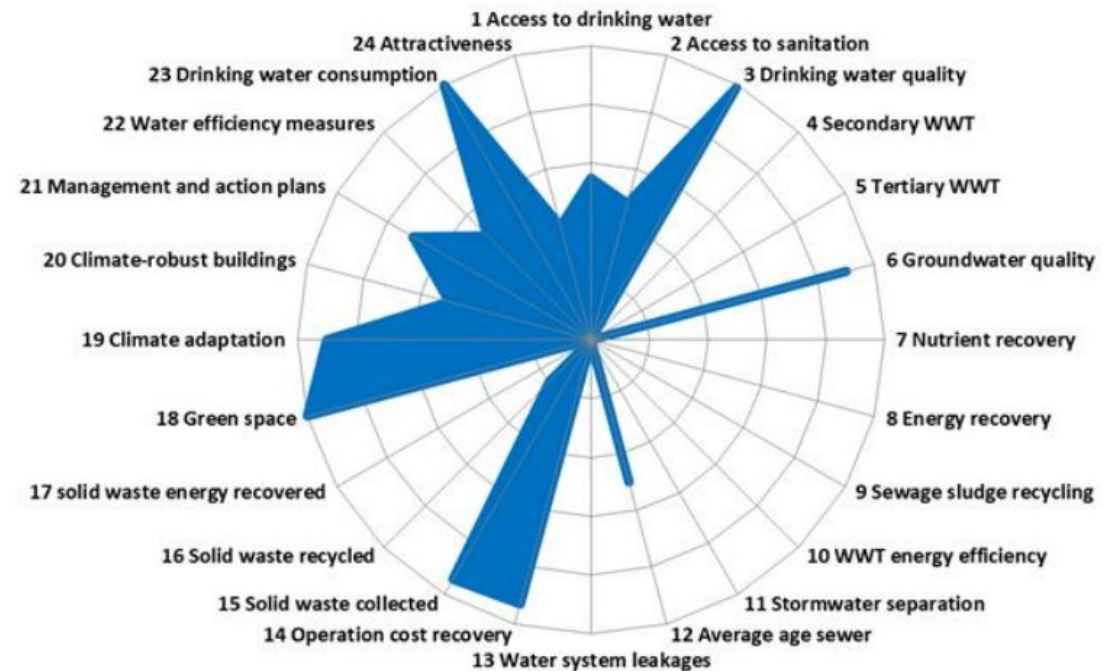


The City Blueprint approach is a **diagnosis tool** to help cities understand which elements of their **water cycle** have to be **improved** and which are already **sustainable**. UNESCO has applied the City Blueprint Framework (CBF) assessment in **10 cities in Africa** to evaluate the cities' water management.

Cities evaluated (2019-2022)




- Yaoundé (Cameroon)
- Bangui (Central African Republic)
- Abidjan (Côte d'Ivoire)
- Libreville (Gabon)
- Nairobi (Kenya)
- Windhoek (Namibia)
- Abuja (Nigeria)
- Lagos (Nigeria)
- Lusaka (Zambia)
- Harare (Zimbabwe)



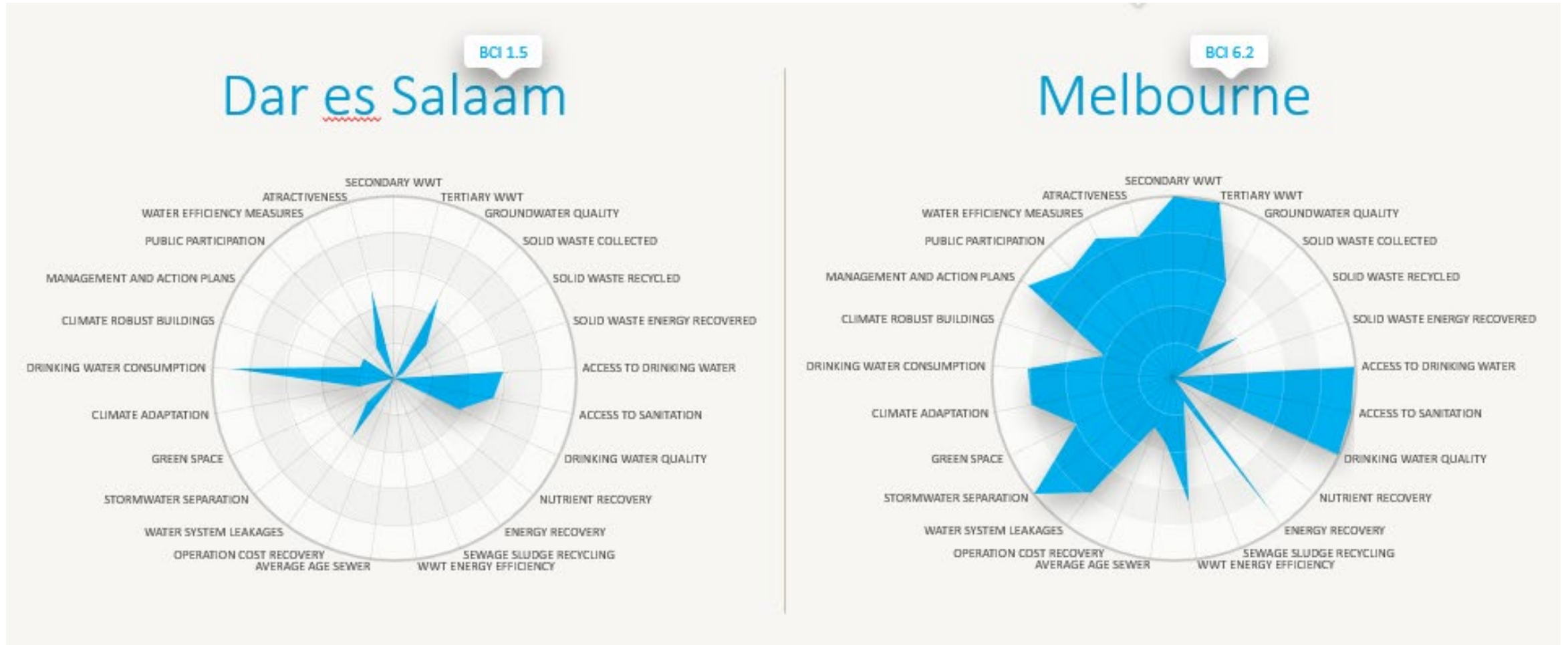
City Blueprint Framework analysis in Libreville (GABON)

Water management in cities: City Blueprint Framework

<p>City Blueprint Performance Framework</p> 	Goal	Baseline assessment of the sustainability of Urban Water Resources Management
	Indicators	<p>Twenty-four indicators divided over seven categories:</p> <ol style="list-style-type: none"> 1. Basic water services 2. Water quality 3. Wastewater treatment 4. Water infrastructure 5. Solid waste 6. Climate adaptation 7. Plans and actions
	Data	Public data or data provided by the (waste) water utilities and cities based on a questionnaire
	Scores	0 (concern) to 10 (no concern)
	BCI	Blue City Index, the geometric mean of 24 indicators which varies from 0 to 10
	Stakeholders	Water utility, water board, city council, companies, NGOs, etc.
	Process	Interactive with all stakeholders involved early on in the process

The City Blueprint Framework approach is developed by KwR.

Water management in cities: City Blueprint Framework



Urban and rural water management in the Balkan region

Extrabudgetary project funded by the SIAAP, France

Beneficiary countries: Albania, Bosnia and Herzegovina, and Montenegro

Objective: To help countries in the Balkan region to achieve the SDG 6 “Clean water and sanitation” and national agendas on sustainable development, by improving water management and environmental policies.

Phase 1 (2022-2023): To gather data and information on water management in cities and rural settlements in order to prepare a state-of-the-art analysis highlighting the more pressing needs in each country related to drinking water and wastewater management.

Output: a publication with the results of the analysis, highlighting the needs and priorities related to urban water management in each country and at the regional level.

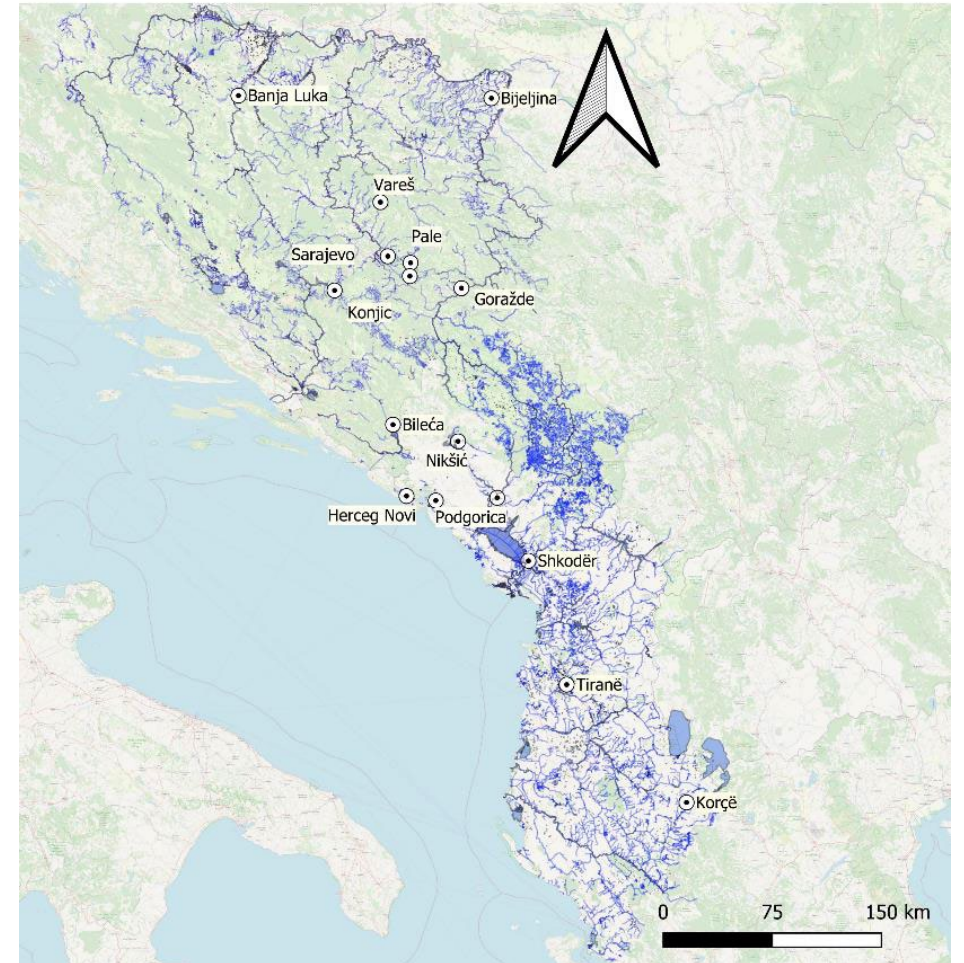
Phase 2 (2024-): To provide local/regional capacity building programmes (training in local languages), based on the priorities and needs identified for strengthening urban water management in the region



Needs assessment of urban and rural water management in the Balkan region

Focus: Identify the needs and priorities, and recommend solutions, for improving water management systems in cities and rural settlements, while getting acquainted with the EU water-related policies and management experiences by:

- developing supporting tools for decision making in the water sector
- strengthening the capacity of professional staff in the water sector
- supporting capacity building of water related actors
- raising awareness of water consuming sectors on water related issues



Needs assessment of urban and rural water management in the Balkan region

Share of water losses and share of wastewater treated

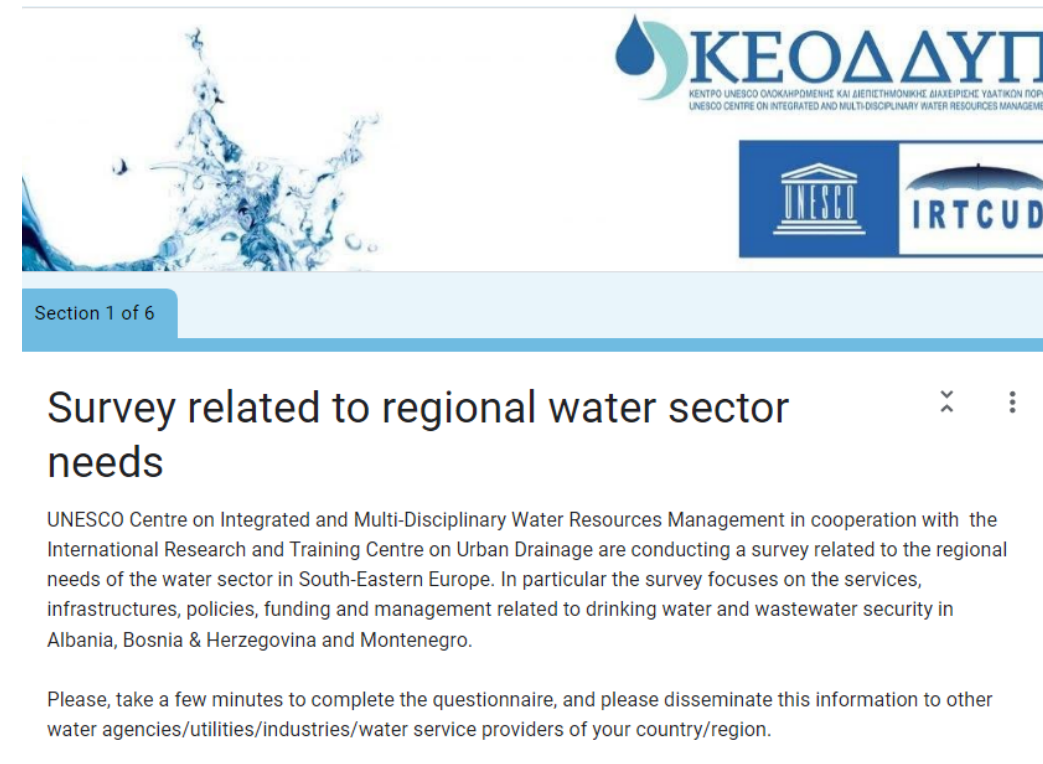
Water agency (City)	Share of water losses	Share of wastewater treated
Tirana	65%	Not answered
Shkoder	60%	90%
Korce	35%	50%

Proportion of water supply (production) from surface water and groundwater

Water agency (City)	Surface water	Groundwater
Tirana	24%	76%
Shkoder	0%	100%
Korce	15%	85%

Percentage of people living in the jurisdiction of your agency with access to safe drinking water and proportion of total connections that are metered

Water agency (City)	Access to safe drinking water (%)	Total connections metered (%)
Tirana	97.03%	90%
Shkoder	60%	75%
Korce	100%	80%



Section 1 of 6

Survey related to regional water sector needs

UNESCO Centre on Integrated and Multi-Disciplinary Water Resources Management in cooperation with the International Research and Training Centre on Urban Drainage are conducting a survey related to the regional needs of the water sector in South-Eastern Europe. In particular the survey focuses on the services, infrastructures, policies, funding and management related to drinking water and wastewater security in Albania, Bosnia & Herzegovina and Montenegro.

Please, take a few minutes to complete the questionnaire, and please disseminate this information to other water agencies/utilities/industries/water service providers of your country/region.

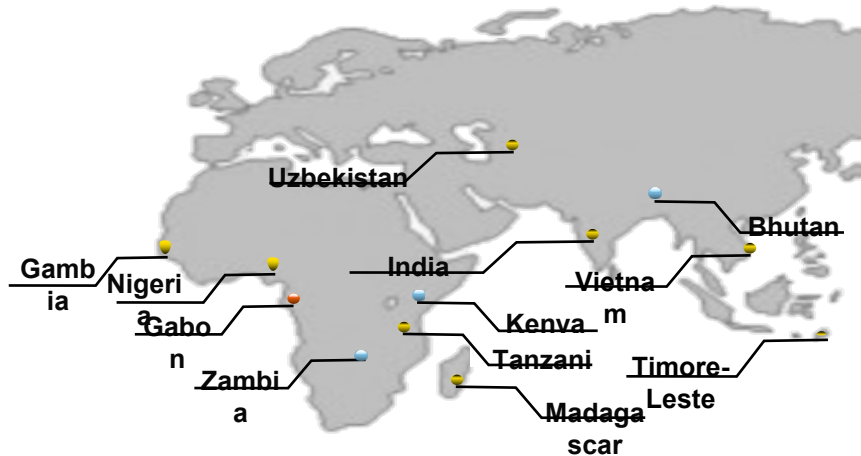


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Sustainable Water Security in Human Settlements in Developing Countries under Climate Change

10-year extrabudgetary project, funded by the Republic of Korea

Supporting **10 countries in Asia** and **10 countries in Africa** to enhance water security in human settlements



Sub-projects in preparation: in 7 countries (Madagascar, Tanzania, Gambia, Nigeria, Vietnam, Timor-Leste, Uzbekistan).

Gabon: A study focusing on the seasonal limitations of **water availability at the Ntoum water treatment plant** was completed. The **climate risk-based decision analysis methodology** was applied to analyze the effect of climate change on water resources in upstream of the plant. It identified adaptation options to improve the water security in Libreville.

Kenya: A study on the **groundwater management in Nairobi** was carried out. Capacity building was provided for Kenyan water professionals.

Bhutan: The project supports the collection of **basic data on major national rivers**, the installation of an **automatic water quality monitoring** system, and strengthening of the capacity of officials and experts.

Zambia: The project supports groundwater resources development to **prevent water shortage in the Mansa resettlement area**, by identifying and mapping aquifers to evaluate groundwater water resources.

India: The project “*Towards Adoption of Data-driven Integrated Urban Water Management in India*” aims at supporting to **the development of an integrated water database for the City of Gwalior**, State of Madhya Pradesh, towards Integrated Urban Water Management for enhancing climate resilience.



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**Intergovernmental
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Thank you!

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Division of Water Sciences

Intergovernmental Hydrological Programme (IHP)

Natural Sciences Sector

Paris, France