



unesco

# Megacities Alliance for Water and Climate (MAWAC)

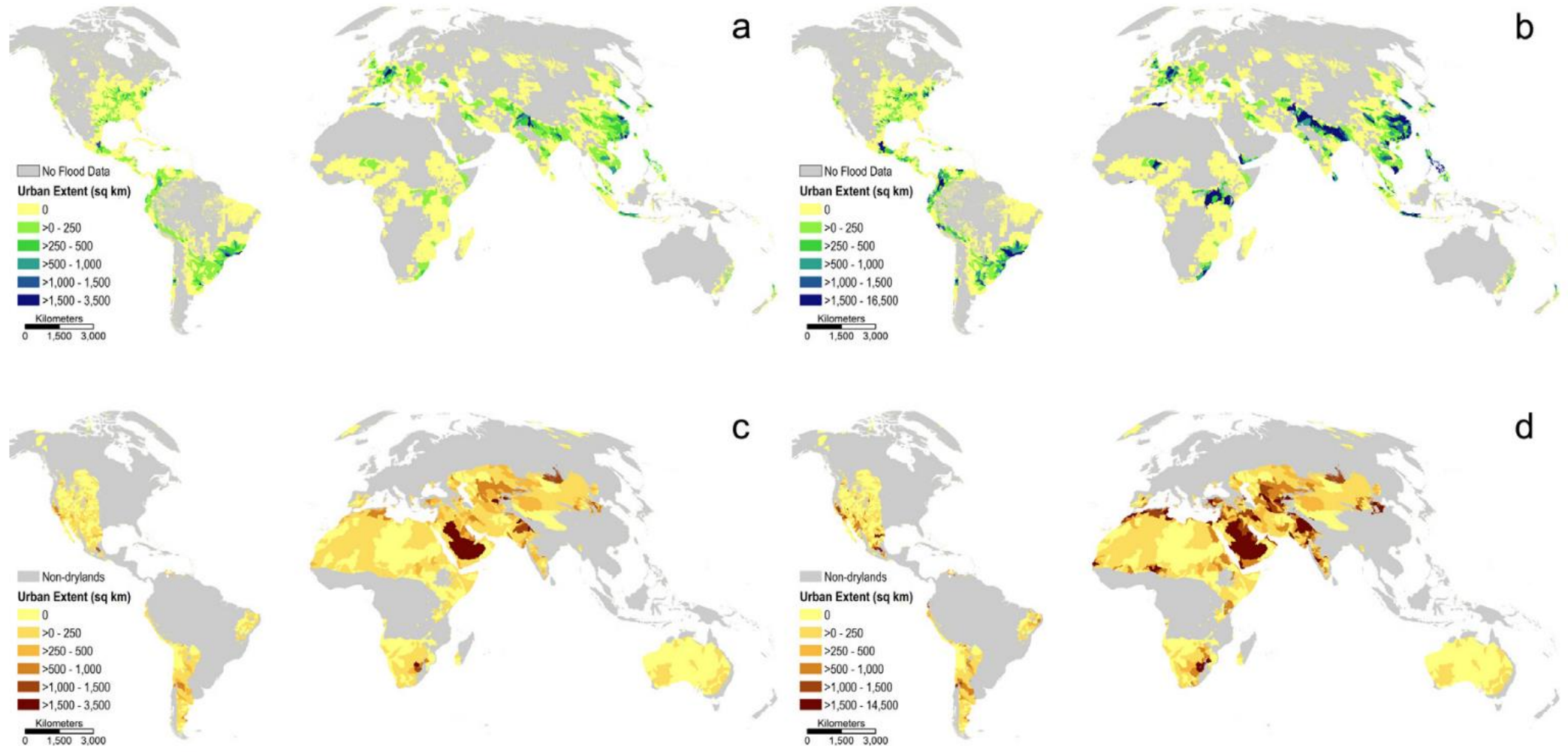
Brief Introduction



Presented by Mr. Alexandros Makarigakis  
Programme Specialist of UNESCO

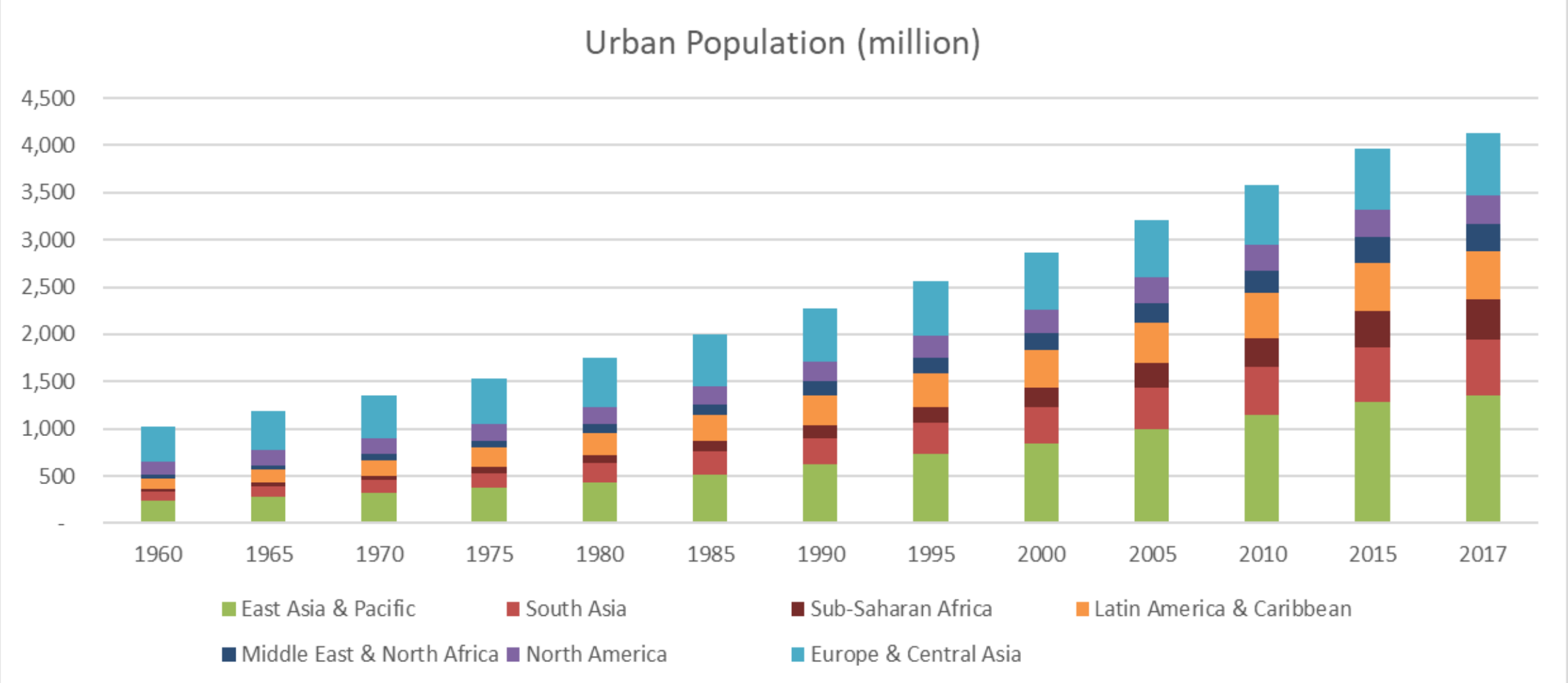
Date: June 14, 2021

<https://en.unesco.org/mawac>  
<https://en.unesco.org/events/eaumega>



**Fig. 3.** Urban land within the high-frequency flood zones in 2000 and 2030 (a and b, respectively) and within the drylands in 2000 and 2030 (c and d, respectively) watershed.

## Population growth

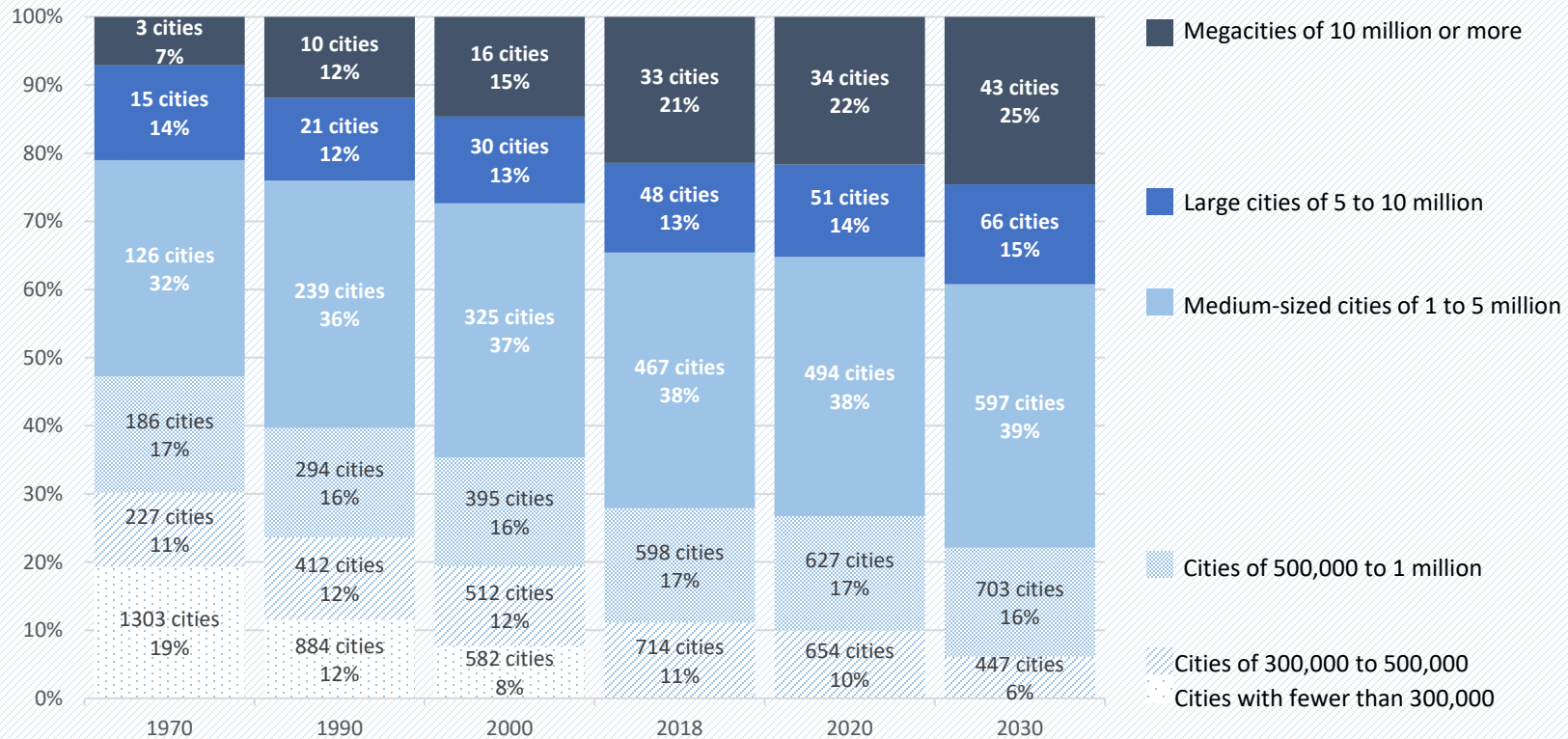


# Global Challenges

## Urbanization

- Megacities will host more than 1 billion inhabitants in 100 megacities in 2030
- 60 % of the world's population will live in urban areas

Share of City Inhabitants in the World Urban Population (1970-2030exp)



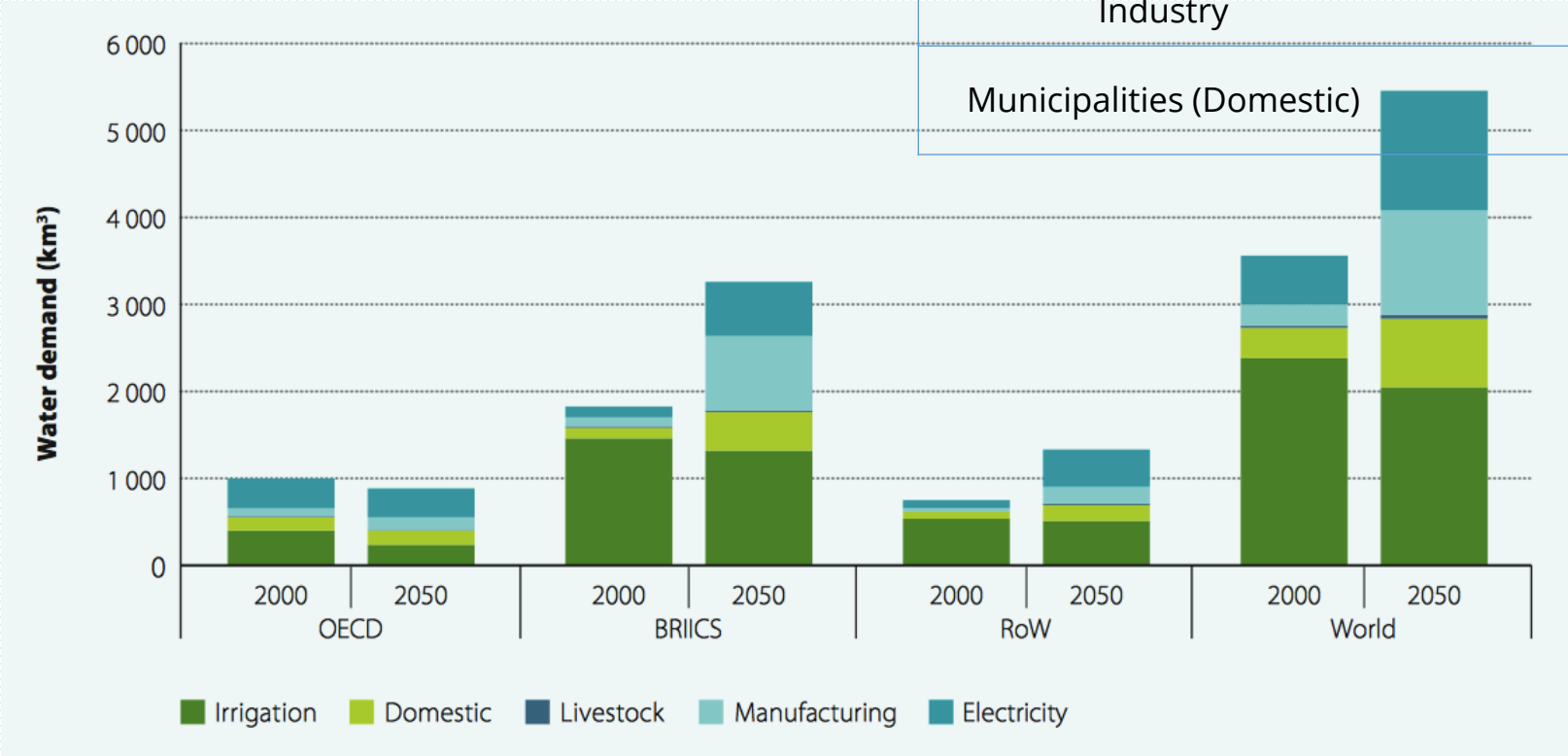
Source : World Urban Prospects UN - 2018

# Water and climate threats to our world

## Global Water Demand (2000-2050)

Total Water Demand in 2015 is about 4,000 km<sup>3</sup>. This represents 10 % of available renewable water.

Main Uses of Fresh Water	Percentage of Total Withdrawal - 2015
Agriculture (irrigation)	70 %
Industry	18%
Municipalities (Domestic)	12%



BRICS (Brazil, Russia, India, Indonesia, China, South Africa); RoW (rest of the world).

# Water and climate threats to our world

## Water Security: 21st Century key challenges



2.1 billion of people without a safe water management



844 million people lack access to safe water and 2.3 billion to adequate sanitation.



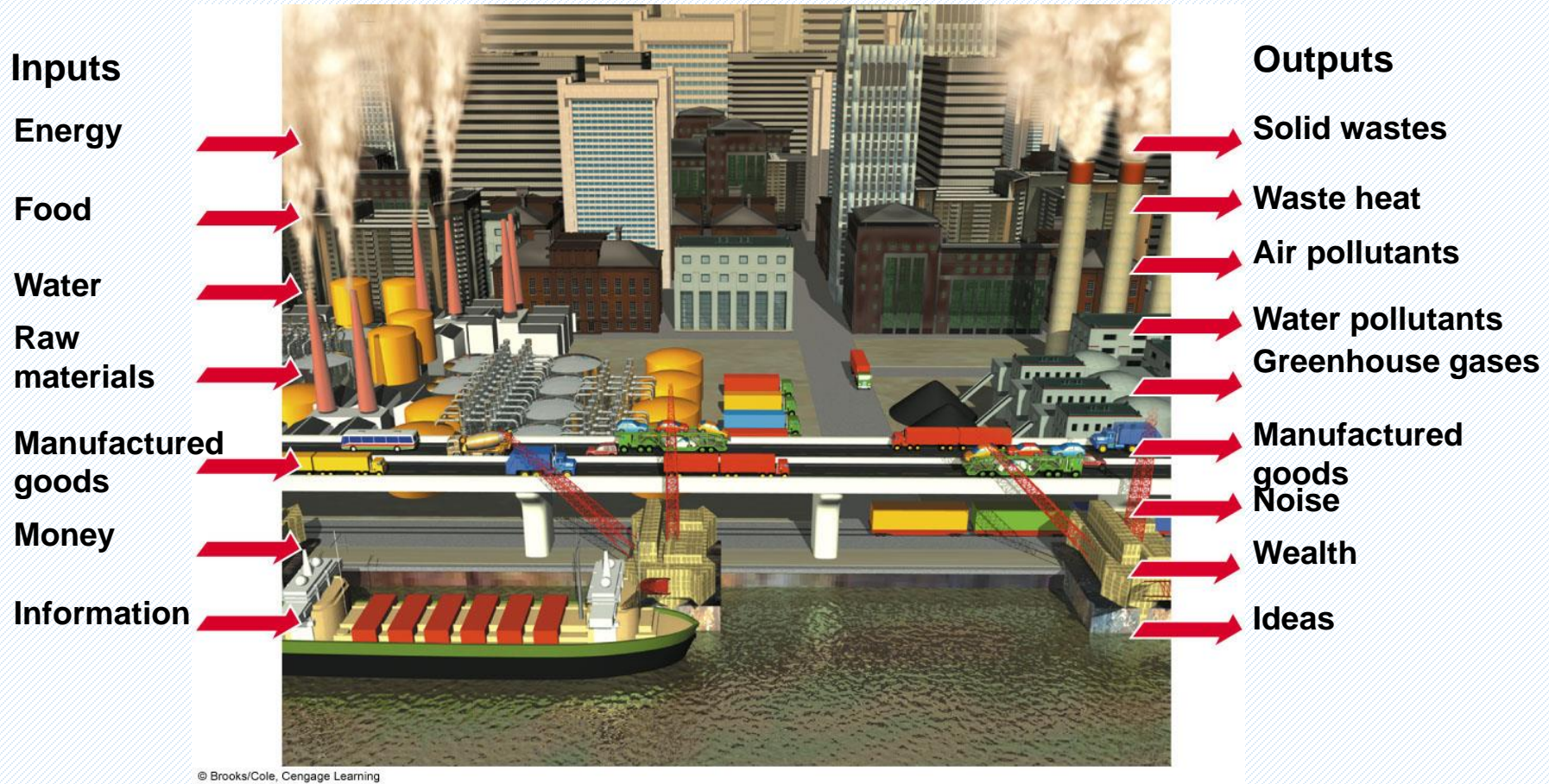
4.5 billion people without safely management of sanitation



Almost 85% of the world's total wastewater is discharged without adequate or any treatment.

# Water and climate threats to our world

Natural Capital Degradation: Urban areas are rarely sustainable systems



# About MAWAC

## 1.1 Objective

**Megacities Alliance for Water and Climate (MAWAC) is an international collaboration platform of the world's megacities.**

It aims to strengthen megacities' capacity to implement global standards and agreements, by promoting trans-disciplinary exchange, and the adoption of integrated approach through **international cooperation**, thus driving towards a paradigm shift in urban water management and climate change adaptation.



**Megacities Alliance for Water and Climate focuses on the cooperation among 4 key stakeholders**

- Decision Maker
- Water and wastewater utility or operator
- Academia
- River basin authority



# About MAWAC

## 1.2 1<sup>st</sup> International Conference "Water, Megacities and Global Change" (EauMega 2015)



- ✓ 388 participants
- ✓ 20 countries
- ✓ 15 sessions (3 in parallel)
- ✓ 55 presentations
- ✓ Portraits of 12 Megacities
- ✓ 7 technical visits
- ✓ Delegates' origins:
  - 42% research and academics
  - 20% local governments
  - 18% private sector
  - 10% State
  - 10% NGO



Opening Session

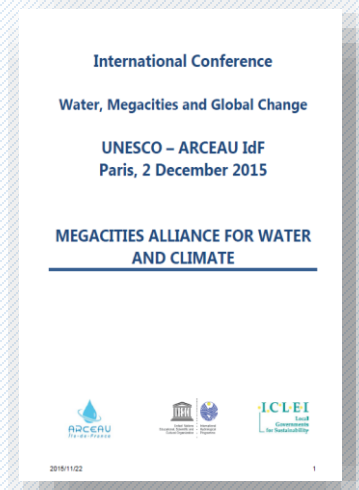
*Irina Bokova  
Former Director General  
UNESCO*

*Naoko Ishii  
President  
The GEF*

*Célia Blauel  
Deputy Mayor  
Paris*

### Key output

A declaration is signed between UNESCO-IHP, ARCEAU-IdF and ICLEI as a **Call for Action to create a platform for sharing experiences and good practices in urban water management**, entrusting UNESCO-IHP to set up a Task Force (Working Group) in charge of providing the preliminary conditions for the emergence of this platform.



# About MAWAC

## 1.3 Publication: Water Megacities & Global Change: Portraits of 16 Emblematic Cities of the World (2016. 2019)

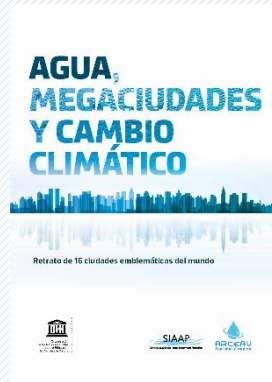
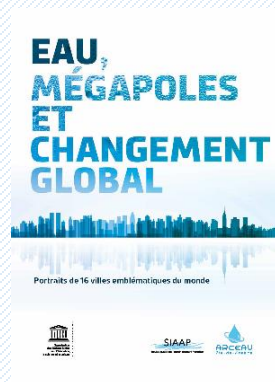
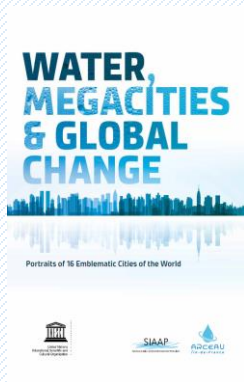
### Megacities



### Contributors

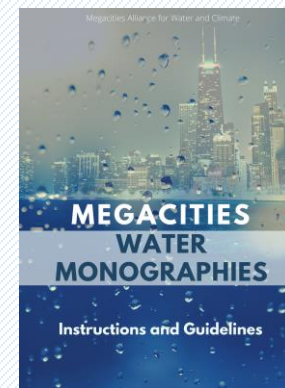
It is the collective contribution of 33 authors from around the world and also to the financial and intellectual support of 3 major institutions: CONAGUA (Comisión Nacional del Agua), SUEZ Environment and SIAAP.

### Languages



The 16 Megacities Monographies were launched during the Habitat III in 2016.

In 2020, UNESCO is planning on authoring new water monographies (2020-2022). The new water monographies allows for performing a comparative analysis among the data and information in megacities.



View full version: <https://en.unesco.org/mawac/resources>

### Challenges and Adaptation

#### Drinking Water

**Mumbai:** non-revenue water fell from 65% in 1994 to 24% in 2014, approaching its 2030 target between 15-17%.

**Tokyo and London:** achieving higher performance on controlling leakage rate.

**Mumbai:** nearly 75% of domestic connections are covered by domestic meters, and some shanty towns are gradually metered by shared standpipes.

**Buenos Aires:** water and sanitation services are funded by state grants, more than income charges, which is converse from the case in London, New York and Chicago.

**Lagos:** drinking water charges by informal private operators is much more expensive to public water corporation, 1:33

#### Sanitation

**Manila:** 99% of population have access to drinking water , while less than 15% of city habitants is connected to sewer system; 85% of households have to rely on individual treatment system.

**New York:** progressive policy on treatments were in place in early 1990s, until 2000 wastewater treatment plants were constructed.

**Istanbul:** high performance biological treatments were invested to control untreated water pollution into Sea of Marmara since 1980s.

# Water and climate threats to our world

Findings from 16 Megacities Monographies (2/4)

## Challenges and Adaptation

### Managing stormwater

**Beijing, Lagos, Buenos Aires and Mumbai:** insufficient capacity of rainwater drainage systems become one of the major cause of urban flood during rainy season.

**New York:** 40% of the city is covered by a system that separates domestic waste water from rainwater.

**Paris:** sanitation operator – SIAAP ensures a storage capacity of almost 1 million m3 and is equipped with real-time system to manage wastewater and rainwater.

### Green infrastructure solution

**Tokyo, London, Los Angeles, Chicago and New York:** green infrastructures (green roofs, rain garden, rain barrels, permeable pavement etc) are widely adopted in urban re-development plan, contributing to air quality and pedestrian-centered environment.

But such approaches usually appear in megacities in rich countries in the form of pilot initiatives which is limited in scope.

### Water Energy efficiency

**New York:** “OneNYC” plan aims at reducing green house gas emission by 80% during 2006 and 2050, and wastewater plants of city center is targeted to attain “net-zero energy”; but reducing carbon footprint is not yet prioritized by Lagos, Manila and Mumbai.

### Prevention in Risks

### Challenges and Adaptation

**Istanbul:** scientific assessment studies are carried out by preparing maps to identify confirmed and potential risk areas

**Mumbai:** in addition to investment in infrastructure, Mumbai also provides training in catastrophe management to technical teams and non-technical counterparts such as NGOs and community-based organizations.

**Beijing:** advertising campaigns and awareness programme on risk reduction have been carried out through media

**Los Angeles:** cutting-edge treatment system of reproducing purified water, which can infiltrated into groundwater and thus help reconstitute the resources and ensure the availability, has been constantly invested since 1979

**Mexico city and Istanbul:** 11m<sup>3</sup>/s of urban untreated wastewater has been reused for services, public parks of the Mexico metropolitan area and for irrigating agricultural land; Istanbul water operators ISKI used sand filtration and UV disinfection to reuse the treated water in toilet flushes and industrial process.

**Mexico city:** massive infrastructures to increase water availability of additional 30 m<sup>3</sup> of additional resources by drawing supplies from adjacent basin 14 km away, and overcoming drought challenges

### Challenges and Adaptation

#### Water governance

**Lagos:** the institutional framework has resulted in competing legislatures within the ministries among different counterparts, making water governance yet ineffective.

**Buenos Aires:** water management and environmental protection have been fallen into specific jurisdiction and organization based on competence areas of stakeholders – national operators, provinces and municipalities. Still, coordination among these actors remain the greatest challenges.

**Manila and London:** water infrastructures and services are monitored by the public body of Manila–Metropolitan Water and Sewage System, while two private concessionaires undertake actual management and improvement based on contractual requirements.

This is also the case in United Kingdom: the Office of Water (OFWAT) which is the regulatory body, has closely supervised the four companies tasked with providing services.

#### Regulation and Legal Framework

Many practices in megacities water management are either constrained by territorial management, or specific regulations

#### Service Operators

Human resources and financing constitute the key driving components to ensure the continuity and operation of water system

#### Civil Society

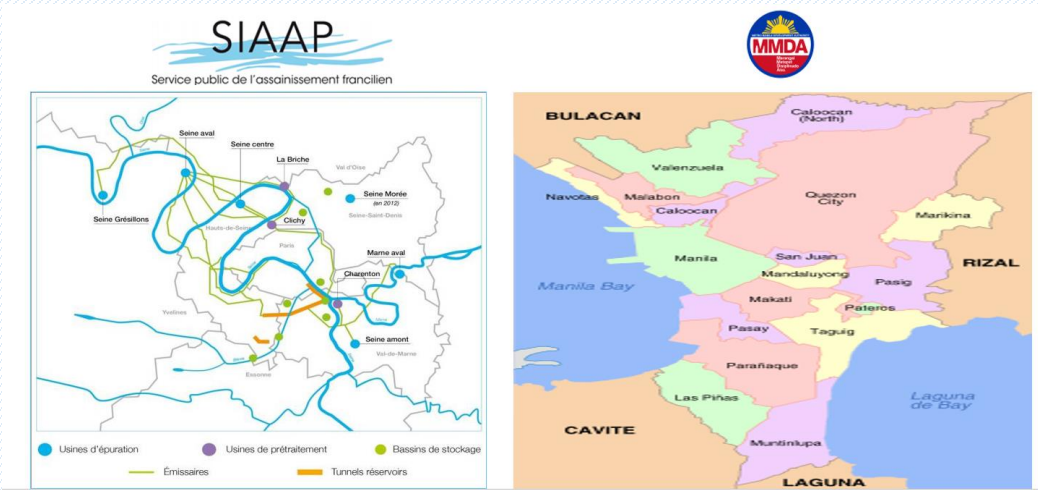
Civil society organizations have been actively involved in water education campaign, providing service user feedback and speaking the voice of water underserved communities through bottom-up approach.

# About MAWAC

## 1.5 An example of cooperation under MAWAC's umbrella: Paris/Manila and the rehabilitation of Pasig River

### Context

In **Manila**, less than 15% of the city's population is connected to a sewerage system. The Pasig River, which is its main water source, is clogged with solid waste and is today considered biologically dead. **SIAAP, the Greater Paris Sanitation Authority**, as a founding member of the Alliance, is developing the **detailed action plan for sanitation of the megacity of Manila**.



The project focuses on the rehabilitation of Pasig River, and will construct and operate a pilot plant for the treatment of wastewater and septage using phytoremediation technology to study its possible widespread application in Metro Manila as a cost-effective and sustainable means for the rehabilitation of Pasig River, for mitigating the effects of climate change, and for attaining the SDGs.

# About MAWAC

## 1.4 Joining the Global Alliance for Water and Climate (GAFWAC) in 2016

"

In 2016, on the official Water Day of COP22 organized in **Marrakech in the framework of the Global Climate Action Programme (GCA)**, the Global Alliance for Water and Climate (GAFWAC) was born through the ratification of The **Marrakech Declaration of Global Alliances for Water and Climate**.

"

### MARRAKECH DECLARATION OF GLOBAL ALLIANCES FOR WATER AND CLIMATE (GAWC)

#### 3. The Alliance of Megacities for Water and Climate Change

It was launched as a collaborative effort of UNESCO-IHP, ARCEAU and International Council for Local Environmental Initiatives (ICLEI); Local Governments for Sustainability) to establish an International Platform for Cooperation to facilitate a dialogue on water. The aim is to support megacities and fast growing cities, to learn and exchange from each other's experience, partner with appropriate technical, academic, civil society organizations and financial institutions. Further, it aims to design and implement city responses to the challenges of climate change in order to adapt to and mitigate its impacts. The platform will be free to access and open to relevant International Institutions such as other UN agencies, cooperation financing institutions, NGOs, etc. Currently, 16 megacities, representing more than 300 million inhabitants, have prepared their monographs on water and climate change. This content is being shared online in different languages and a synthesized version was launched at the HABITAT III Conference in Quito.



**Megacities Alliance for Water and Climate (MAWAC)**

**Business Alliance for Water and Climate Change (BAFWAC)**

**Global Clean Water Desalination Alliance (GCWDA)**

**"Paris Pact" Alliance**

water and Climate adaptation in the basins of rivers, lakes and aquifers.



# About MAWAC

## 1.5 Joining the UNESCO Cities Platform (UCP) in 2019



MAWAC becomes part of the UNESCO Cities Platform in 2019, where there is wide exposure to multi-disciplinary experience exchange sessions in different cities.

---

### 7 networks within UCP

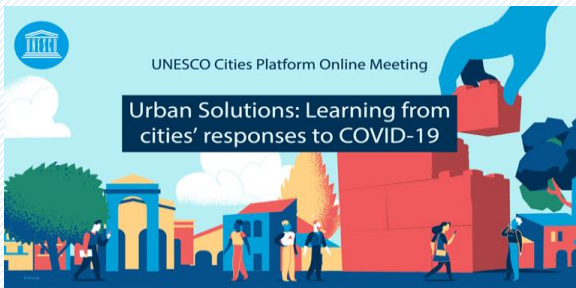
---

- [UNESCO Creative Cities Programme](#)
- [UNESCO Global Network of Learning Cities](#)
- [International Coalition of Inclusive and Sustainable Cities](#)
- [World Heritage Cities Programme](#)
- [Media and Information Literacy Cities](#)
- [UNESCO-Netexplo Observatory Cooperation on Smart Cities](#)
- [Megacities Alliance for Water and Climate](#)

### Past Events

#### Webinar: Learning from cities' responses to COVID-19

Speaker from Lagos State Ministry of Environment and Water Resources



#### UNESCO Celebrates the World Cities Day in 2019 and 2020

Speaker from Métropole du Grand Paris



### Next Plan

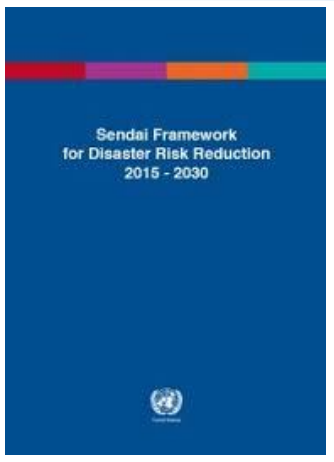
**1**  
Cross-sectors initiative - pilot project in Mexico City

**2**  
World Cities Day in 2021

# 3 Global call for action

Water is connecting all

## 1 Sendai Framework for Disaster Risk Reduction



## 2 Paris Climate Agreement



## 2030 Agenda for Sustainable Development

- SDG 6 “Ensure access to water and sanitation for all”
- SDG 11 “Make cities inclusive, safe, resilient and sustainable”

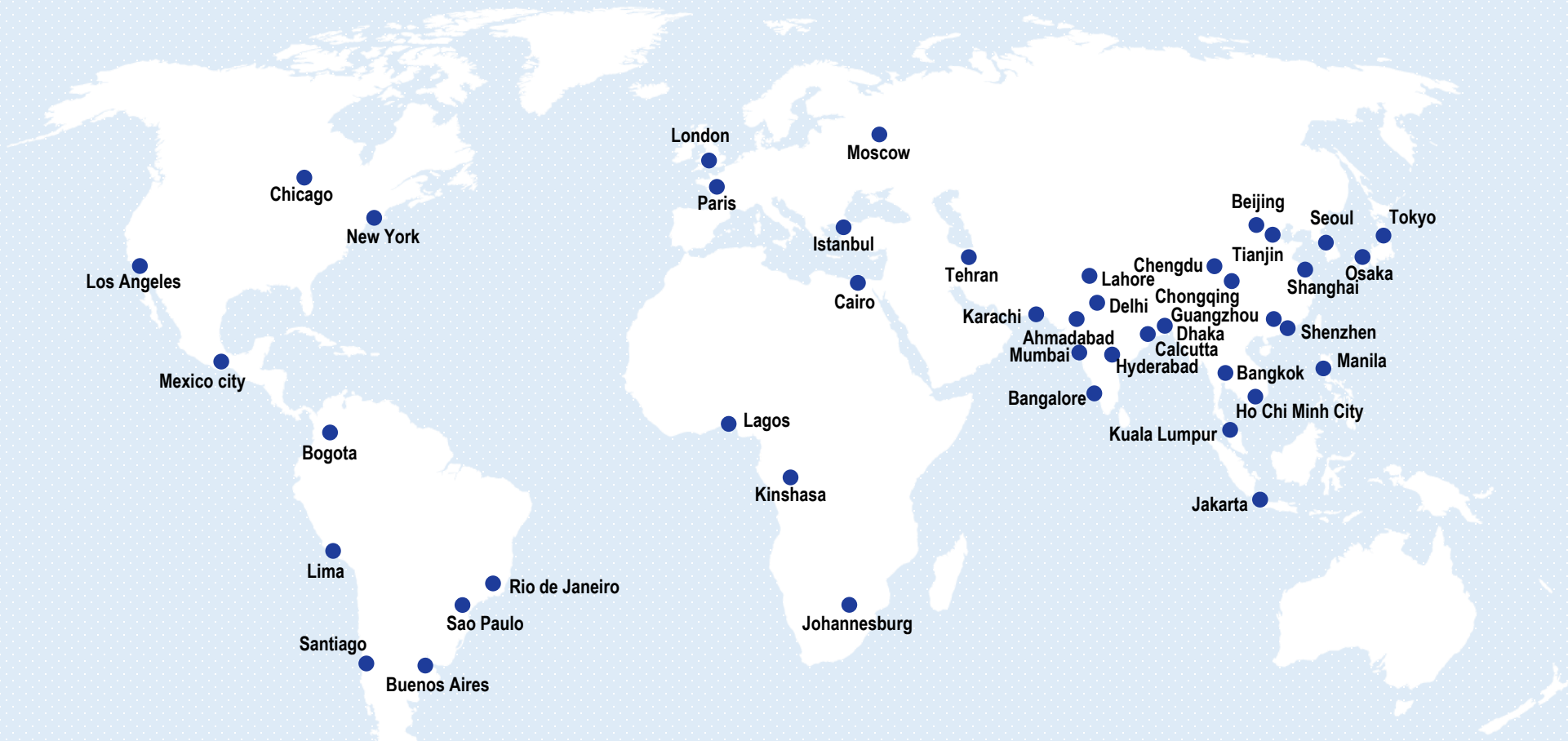


## 3 New Urban Agenda

# 3

## MAWAC – global and regional platform

### 3.1 Global Alliance



Network of over 40 megacities

\* This map only visualize the megacities over 10 million inhabitant based on the World Urban Prospect 2018

- cooperation among 4 key stakeholders
- Decision Maker
  - Water and wastewater utility or operator
  - Academia
  - River basin authority

# 3

## MAWAC – global and regional platform

### 3.2 Regional Alliance

**Context** The idea of regionalization of the MAWAC was proposed in 2016 during a WaterLinks Forum.

**Four regional chapters to be set up:**



#### Regional participation in 2021-2022

The regional chapters will **establish the regional framework (Terms of Reference)** during the regional meetings for dialogue and cooperation, which is expected to pave way for the formal establishment of MAWAC as the global alliance.

The regional platforms will be represented in the **“Regional Session”** at the **Second International Conference “Water, Megacities and Global Change” (EauMega 2022)**.

# MAWAC – global and regional platform

## 3.3 First regional conference for Latin America and the Caribbean (MAWAC-LAC), May 2019

- **UNESCO, ARCEAU, SIAAP, ICLEI-LAC, National Water Authority of Brazil (ANA)**
- 5 Latin America megacities representatives - **Bogotá, Buenos Aires, Rio de Janeiro, Santiago and São Paulo**, together with more than 100 participants.
- A public session dedicated to the shared concerns of the recent challenges in LAC regions
- The **general framework of setting up the regional alliance** for Latin America was drafted by the working group members through the **Terms of Reference (TOR)**, which were agreed in principal by 5 cities and UNESCO.
- An **official agreement** was signed by **São Paulo City Hall and UNESCO**, which acknowledged a long-standing cooperation of LAC regional alliance.

Mexico City

Bogota

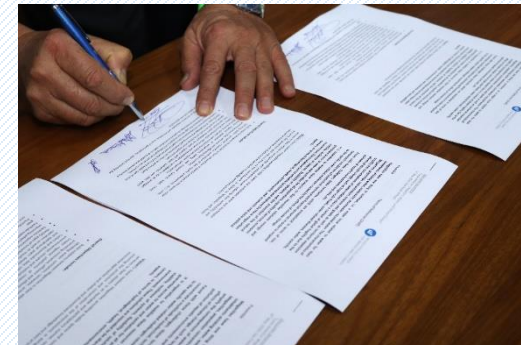
Lima

Sao Paulo

Rio de Janeiro

Santiago

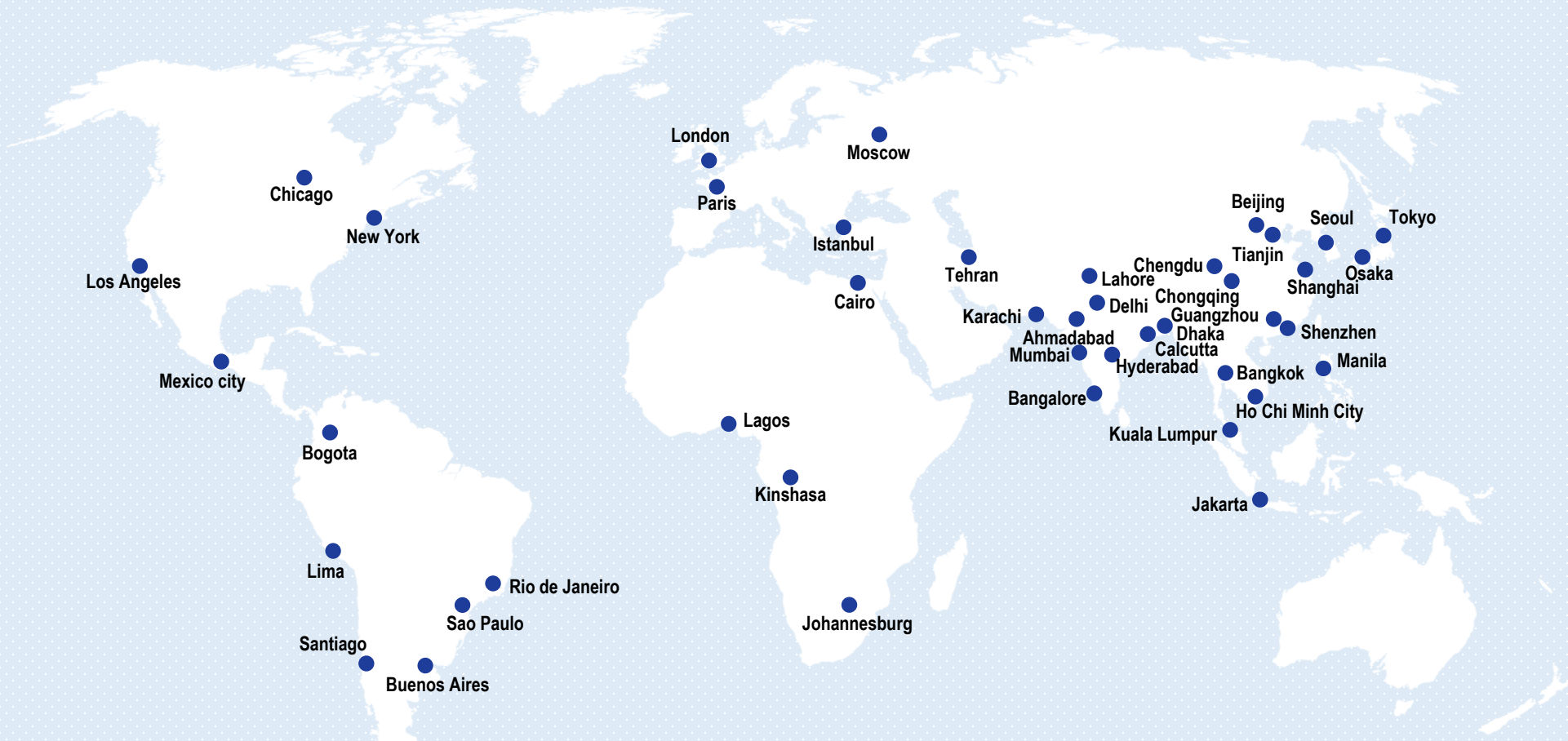
Buenos Aires



# 3

## MAWAC – global and regional platform

### 3.3 Regional meetings in 2021



**MAWAC-LAC meeting**  
May 26, 2021

**MAWAC-ASPAC meeting**  
June 14 -16, 2021

**MAWAC-AFR meeting**  
June 21 - 22, 2021

**MAWAC-ENA meeting**  
July 6 - 7, 2021

Network of over 40 megacities

\* This map only visualize the megacities over 10 million inhabitant based on the World Urban Prospect 2018

# 4

## MAWAC - Roadmap

### Overview in 2021-2022



# MAWAC - Roadmap

## 2<sup>nd</sup> International Conference “Water, Megacities and Global Change”

The **EauMega Pre-Conference** was organized in December 2021 attracting **6,431** audience from **114** countries around the world.

It is a one-step forward for the 2<sup>nd</sup> International Conference “Water, Megacities and Global Change”, scheduled to take place in January 2022 at UNESCO Headquarters in Paris.



### Objective of EauMega 2022

- Produce a scientific and technical overview of water challenges and solutions
- Strengthen the dialogue between science and policy actors at local level
- Officially launch the Megacities Alliance for Water and Climate (MAWAC)

<https://en.unesco.org/events/eaumega>



## Secretariat of Megacities Alliance for Water and Climate

**Headquarters** | Mr. Alexandros Makarigakis, [a.makarigakis@unesco.org](mailto:a.makarigakis@unesco.org)

### Asian and the Pacific region (MAWAC-ASPAC)

- Bangkok Office | Mr. Benno Boer, [b.boer@unesco.org](mailto:b.boer@unesco.org)
- Beijing Office | Mr. Philippe Pypaert, [p.pypaert@unesco.org](mailto:p.pypaert@unesco.org)
- Hanoi Office | Ms. Lan Huong Tran, [l.tran@unesco.org](mailto:l.tran@unesco.org)
- Jakarta Office (main) | Mr. Hans Thulstrup, [h.thulstrup@unesco.org](mailto:h.thulstrup@unesco.org)
- New Delhi Office | Ms. Neha Midha, [n.midha@unesco.org](mailto:n.midha@unesco.org)
- Tehran Office | Ms. Mehrasa Mehrdadi, [m.mehrdadi@unesco.org](mailto:m.mehrdadi@unesco.org)
- Islamabad Office | Mr. Raza Shah, [r.shah@unesco.org](mailto:r.shah@unesco.org)

### Latin America and the Caribbean region (MAWAC-LAC)

- Montevideo Office (main) | Mr. Miguel Doria, [m.doria@unesco.org](mailto:m.doria@unesco.org)
- Brasilia Office | Mr. Glauco Kimura, [g.kimura@unesco.org](mailto:g.kimura@unesco.org)
- Lima Office | Mr. Ernesto Fernandez Polcuch, [e.fernandez-polcuch@unesco.org](mailto:e.fernandez-polcuch@unesco.org)

### Europe and North America region (MAWAC-ENA)

- Venice Office (main) | Mr. Jonathan Baker, [j.baker@unesco.org](mailto:j.baker@unesco.org)
- New York Liaison Office | Ms. Lily Gray, [l.gray@unesco.org](mailto:l.gray@unesco.org)

### Africa region (MAWAC-AFR)

- Nairobi Office | Mr. Samuel Partey, [s.partey@unesco.org](mailto:s.partey@unesco.org)
- Abuja Office | Ms. Enang Efiom Moma, [ee.moma@unesco.org](mailto:ee.moma@unesco.org)
- Cairo Office (main) | Mr. Imam Bisher, [i.bisher@unesco.org](mailto:i.bisher@unesco.org)
- Kinshasa Office | Mr. Jean-Pierre Ilboudo, [jp.ilboudo@unesco.org](mailto:jp.ilboudo@unesco.org)
- Harare Office | Mr. Koen Verbist, [k.verbist@unesco.org](mailto:k.verbist@unesco.org)
- Yaounde Office | Ms. Annie Claude Nsom Zamo, [ac.nsom-zamo@unesco.org](mailto:ac.nsom-zamo@unesco.org)

# Thank you



**unesco**

United Nations  
Educational, Scientific  
and Cultural Organization