WATER SCARCE CITIES

# Water Scarce Cities Initiative

## PROBLEM STATEMENT

**Population growth, urbanization, economic expansion, and to a lesser extent climate change, will heighten scarcities where water already is in short supply.** Currently almost a quarter of humanity lives in countries of physical water scarcity, and this number may double in the next two decades. While the demand for water in cities is projected to increase by 50 to 70 percent within the next three decades, reduced freshwater availability and competition with other uses will constrain municipal water consumption: in the South Asia and Middle East and North Africa (MENA) Region, per capita consumption in 2050 may decrease by 15 to almost 50 percent compared with the situation in 2015. Overall, the number of urban dwellers worldwide living with seasonal water shortages is forecast to grow from close to 500 million people in 2000 to 1.9 billion in 2050. Water pollution may in addition contaminate and contribute to diminishing the fresh water that can be used for production and human consumption, and by the environment.

**Effective management of water resources will be critical to sustain inclusive and sustainable urban water services across water scarce regions** such as MENA, the Sahel, Southern Africa, Central Asia, or parts of Latin America. Sustainable and affordable water services contribute to inclusive growth and political stability in fragile contexts. Water services are at the center of the social contract and failure of the state to provide them can result in instability, especially in large urban centers. The refugee crises affecting many countries in the region are exacerbating pressures on limited water resources in urban areas and, if not well managed, could lead to social tensions and increased fragility.

**Despite clear evidence of dwindling resources and escalating urban water demand, cities worldwide continue to rely on traditional solutions based on abundant resources and silo-oriented engineering approaches to increasing water supplies**. In this model, urban water management is segmented, linear and narrow in focus, and disconnected from the watershed: water is abstracted from surface and groundwater sources with limited understanding of sustainability constraints and coordination with other, non-municipal users; wastewater and stormwater are swiftly channeled out of cities and into receiving waterways; the scale of urban water uses and opportunities to manage them remains unchallenged.

**A number of cities and states, such as Amman, Malta, Windhoek, Los Angeles, Singapore or Perth, have had substantial success tackling physical water scarcity** by (i) diversifying water resources and supply strategies to hedge against risks associated with their depletion or pollution, and/or (ii) closing the urban water cycle to increase its resilience to external climate shocks. This could be achieved for example by managing treated wastewater or seawater as alternative resources, capturing rainwater for on-site use or stormwater to replenish aquifers, and using or treating brackish groundwater for specific uses. The urban water cycle is recognized as one system in which efficiencies can be achieved at all levels (through demand management, reduced leakages, etc.). Its management model relies on a variety of technical and institutional solutions. It requires integrated planning and management mechanisms embracing a water resource perspective at river and aquifer basin levels. These principles are often captured under the concepts of integrated water cycle management (IWCM) or integrated urban water management (IUWM).

**In water scarce areas, aquifers play a particularly important role in the water cycle approach and in support of urban water security.** While not present under all cities, where they exist, aquifers are re-emerging as the key element in developing an integrated approach to water security. A significant proportion of the cities in water scarce areas originally developed on the basis of extensive groundwater resources. However, over time these resources were over-exploited and/or polluted and in the case of coastal cities, subject to sea water intrusion. As a result, cities became increasingly dependent on “imported water” provided from distant reservoirs through major conveyance infrastructure. Recently, a number of cities have recognized that given the threats to external supplies of water resulting from competition during drought years and in some cases the threats to conveyance infrastructure from natural and man-made disasters, they should focus on rehabilitating their underlying aquifers. These aquifers serve as safe water storage, and when used in conjunction with grey and green wastewater treatment infrastructure, become part of the water treatment and reuse cycle. Hence, the health of the underlying aquifer is often seen as an indicator of the “health” of the urban water management system.

**These practices can be complex and challenge existing institutional arrangements, and there has so far been limited progress towards mainstreaming the integrated water paradigm.** They require enhanced vertical cooperation between agencies involved in water resources management at the basin level and beyond (state, region, basin agencies, etc.), and horizontal cooperation between agencies involved in water supply, sanitation and drainage services, as well as urban development and sometimes solid waste management. Despite an emerging consensus that conventional water management approaches are ill-equipped to tackle increasing urban water stress, the perpetuation of obsolete water management approaches stems from (i) weak and fragmented sector governance, including a lack of accountability, incentives and mandates to change water management approaches and encourage technological innovation ; and (ii) a lack of awareness of alternative and economically viable technical solutions, and limited capacity to implement them.

Yet, across water scarce regions, countries characterized by common scarcity challenges exhibit a diversity of responses and achievements. Therefore, there is tremendous scope for sharing and promoting practical knowledge, so that integrated urban water management does not remain limited to isolated successful projects, but instead becomes a dominant approach implemented across the region.

# OBJECTIVE

**The objective of this initiative is to bolster awareness of integrated approaches to managing water resources and service delivery in water scarce cities as the basis for water security and climate resilience.**

This will be achieved by:

**1** **Generating knowledge** on improved urban water management approaches in a water scarcity context, building on the review of water scarce cities experiences around the world. In particular, case studies will be prepared to review how cities around the world tackle water scarcity and manage to secure sustainable and resilient urban water supplies. The case studies will describe the nature of the local challenge from a water resources perspective, the technical solutions, costs and institutional mechanisms put in place. They will analyze the political economy around their adoption, identify the drivers of change and analyze how governance, capacity or technological challenges were addressed, and ultimately draw lessons and recommendations applicable to other cities facing water scarcity challenges.

**2** **Facilitating multi-stakeholder dialogue, knowledge flow and collaboration** through establishing a global network of practitioners and experts on the subject of urban water management in water scarce regions. This would include state/local government, water agency and utility managers with firsthand experience dealing with water scarcity or interest in exploring new approaches, and academic think-hubs that are fostering knowledge flows, in order to bring that experience to our countries, cities and utilities most in need.

**3** **Supporting concrete engagement to support water scarce cities**, including through the facilitation of technical assistance in interested cities. This support could include assessing current water resources management approaches, identifying opportunities based on knowledge generated through the initiative, or incentivizing the application of innovative approaches.

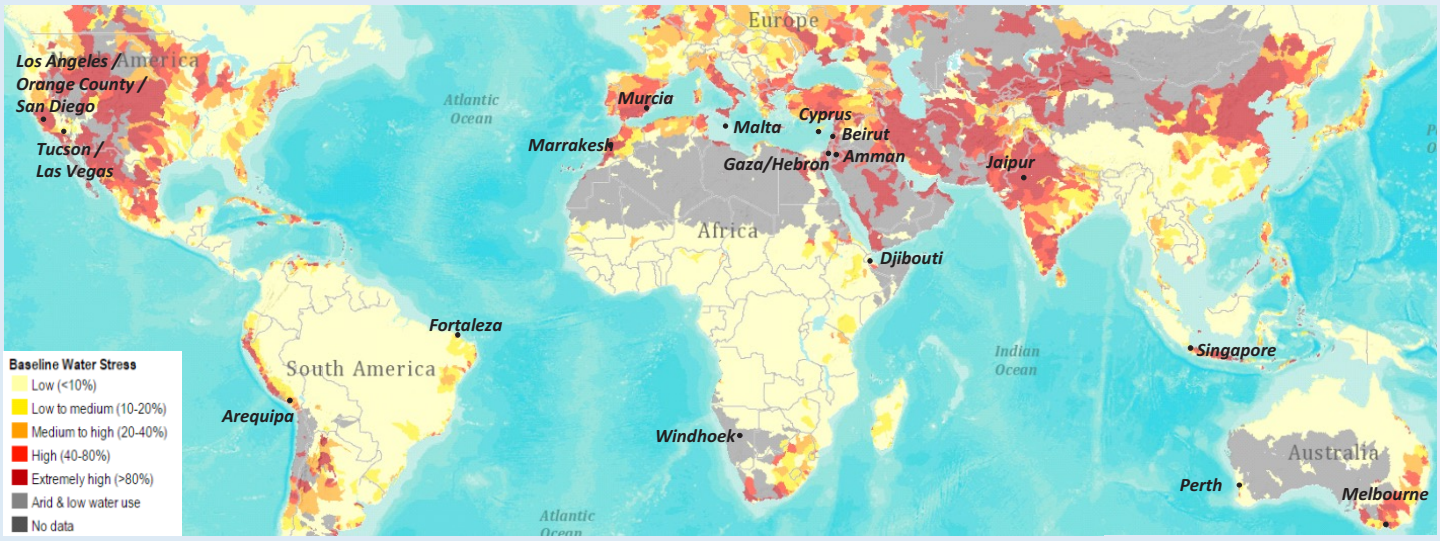


**Figure:** Preliminary selection of case study, baseline water stress (ratio of total annual water withdrawals to total available annual renewable supply) *(WRI Aqueduct Water Risk Atlas)*

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