crescent collaboration between Brazil and the EU to identify common research and innovation agendas and mutual learning opportunities, connecting Brazilian and European R&I actors with the objective of i) leveraging nationally funded research in Brazil and within the EU, ii) connecting R&I centres and their communities, iii) empowering the young generations of researchers and innovators, iv) maximizing/ sharing resources and infrastructures, and v) actively involving governing bodies and encouraging citizen participation.

Under the umbrella of the Urban Water Management theme, a series of research and innovation areas of action have been identified:

- Urban forestry: impact on the city's microclimate, recreational value and water resources, new recreational values, protection of urban biodiversity, controlling the city microclimate, adapting the cities to climate change, new educational opportunities to citizens, new research opportunities for local universities, areas for recharge of ground waters, control of floods and drainage.
- Stormwater management: tackling urban environment pollution;
- Urban regeneration and water management: closing the water cycle gap;

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- **The food-energy-water nexus:** water productivity and urban environmental services (capturing value from waste and nutrient recovery);
- Water bio-based solutions: urban biocycle economy;
- Public health and environment protection: urban wastewater treatment;
- **Urban big data:** developing urban intelligence and water monitoring technologies;
- Water environmental challenges: political and social awareness.
- Recovery of degraded **urban** ecosystems, urban rivers and wetlands.



# Policy Brief: Urban Water Management



OF MINISTRY OF SCIENC



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## **1.** INTRODUCTION: URBAN WATER CHALLENGES

#### Brazil-EU/EU-Brazil collaboration: finding solutions through joint efforts

The world is facing numerous challenges, which require coordinated efforts and joint initiatives to align priorities, to produce and disseminate new knowledge and to maximise impact. With an **estimated population of 9.7 billion inhabitants by 2050**, with a significant **concentration in urban areas**, it is imperative to develop and implement sustainable, inclusive, resilient and secure models for the cities of the future and, simultaneously, assure the sustainable management of our natural resources.



Demand for water, energy and food will necessarily rise, with obvious implications in human health and in the environment. In particular, since 2015 that water crisis is being identified in the context of the World Economic Forum as one of the most relevant risks to economy and society. Building resilience and adapting to climate change and variability are vital to ensure



the improvement and modernisation of basic services and to increase the population well-being, in a context where floods, droughts (and windstorms) account for almost 90% of the 1,000 most disastrous events since 1990.

The Sustainable Development Goal 6, Synthesis Report 2018 of Agenda 2030, "The world is not on track" pointed out 7 fundamental failures in basin sanitation; governamental structure; agricultural stress on water resources; lack of technical capacity; deterioration of ecosystem services; water pollution; basic sanitation and lack of funding for water. All these problems are related to urban waters management, access and governance.

In force since 2007, the EU and Brazil Science & Technology Agreement has led to intensive collaboration activities in research and innovation translated by more than 350 common projects. The EU Research and Innovation Programmes represent the main instrument for cooperation between Brazil and the EU, with Brazil participation ranking sixth among the International Partner Countries in FP7 and in Horizon 2020. Cooperative efforts in research and innovation in the water domain is of particular relevance, as Brazil represents on its own circa **12% of the world freshwater resources** and 21% of the world biodiversity.

Despite Brazil owning the largest hydrographic system on Earth, currently only about 37.4% of sewage is treated and more than 60% of impatient care at hospitals is due to water borne diseases. Water guality, sanitation and emerging contaminants are topics that require joint efforts from the scientific community at large, including the technological and innovation sectors. In addition, it is of fundamental priority to ensure efficient and integrated management of water services and to maintain and develop the urban infrastructure systems to address the growing challenges associated to urban water security and urban water demand



#### 2. URBAN WATER MANAGEMENT: ACTION AREAS

### Research and Innovation topics: a landscape of joint opportunities

Urban water management encloses a wide range of research and innovation topics with strong implications in the economic, environmental, societal and cultural sectors. In addition to the horizontal influence of this theme, there is an inherent complexity associated to the need to combine scientific and technological breakthroughs with a balanced equilibrium between economic growth, quality of life and the environment.

Fulfilling the abovementioned preconditions implies the adoption of a multidisciplinary vision and a holistic approach throughout the whole knowledge value chain, namely among academia, governmental, private and organised civil society sectors. Thus, joint efforts are at demand to generate new scientific knowledge, to develop new technologies and adopt common methodologies in order to accelerate knowledge transfer platforms and to reach society at large.

Therefore the management of water resources in urban waters has to be creative and innovative as a new proposed to articulate Science, Technology, Society and Development. Databases scientific research, technical advances, dissemination of information and society participation have to be integrated in this advanced management system.

The EU-Brazil Sector Dialogues project on Urban Water Management personifies the