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Urban Water Management

Brazil-EU Cooperation

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FEDERAL GOVERNMENT

President of the Republic
JAIR MESSIAS BOLSONARO

MINISTRY OF SCIENCE, TECHNOLOGY, INNOVATION AND COMMUNICATIONS – MCTIC

Minister of Science, Technology, Innovation and Communications
MARCOS PONTES

Secretary of Policies for Training and Strategic Actions
MARCELO MORALES

MINISTRY OF ECONOMY

Minister of Economy
PAULO GUEDES

National Director of the EU-Brazil Sector Dialogues Support Facility
GANESH INOCALLA

MINISTRY OF FOREIGN AFFAIRS

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ERNESTO ARAUJO

Head of the Department of Europe
MINISTRO CARLOS LUÍS DANTAS COUTINHO PEREZ

Head of the Southern Europe and European Union Division
MARCELA POMPEU DE SOUSA CAMPOS

DELEGATION OF THE EUROPEAN UNION TO BRAZIL

Embassador
IGNACIO YBÁÑEZ

First Secretary – Head of Sector FPI-Regional Team Americas
MARIA ROSA SABBATELLI

**Civil Attaché – Programme Officer – Service for Foreign Policy
Instrument (FPI) Regional Team Americas**
COSTANZO FISOGNI

Implementing Consortium
CESO DEVELOPMENT CONSULTANTS/WYG/ CAMÕES, I.P.

Project experts and report authors
JOSÉ GALIZIA TUNDISI
RUI MUNHÁ

CONTACTS

National Directorate for the Facility
DIALOGOS.SETORIAIS@PLANEJAMENTO.GOV.BR
[HTTP://WWW.SECTORDIALOGUES.ORG](http://WWW.SECTORDIALOGUES.ORG)

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TABLE OF CONTENTS

Executive Summary..... 6

Sumário Executivo 8

1. Foreword 10

2. Introduction to Water Challenges..... 19

3. Introduction to Urban Water Management..... 24

4. Research and Innovation on Urban Water Management
within the EU 44

5. Research and Innovation on Urban Water Management in Brazil..... 59

6. Brazil-EU Synergies and Opportunities on Urban Water
Management 77

7. ANNEXES..... 82

8. Bibliometric Analysis..... 106

EXECUTIVE SUMMARY

Sector Dialogues is a cooperation instrument aimed at reinforcing the strategic partnership between the EU and Brazil, based on the principles of reciprocity, complementarity and mutual interest. Sector Dialogues aims to enhance exchange of knowledge, experiences and best practices at technical and political level, in key areas of interest for both sides.

The EU-Brazil Sector Dialogues Support Facility was launched in 2007 to improve bilateral relations and deepen structured sector dialogues in areas of mutual interest within the wider goal of building-up a strategic partnership between the EU and Brazil. Now in its fourth phase of implementation, covering the timeframe 2017-2019, the Facility strengthens its role in facilitating and supporting joint efforts to tackle global challenges.

The Facility is jointly coordinated by the Management Secretariat of the Brazilian Ministry of Economy (ME), the Delegation of the European Union to Brazil (DELBRA) and the Brazilian Ministry of Foreign Affairs (MRE). International partners, who are direct beneficiaries of the Facility, are the Brazilian Ministries and Federal Government Agencies and their corresponding EU General-Directorates and Agencies, which participate in specific dialogues. The supported activities range from the exchange of information and best practices, to the development of joint activities, which in turn approximate the cooperating parties within themes of strategic interest.

As a result of a joint collaborative effort between the European Commission, DG Research & Innovation and the Ministry of Science, Technology, Innovation and Communications of Brazil (MCTIC), implemented through both the MCTIC and with a contribution from the Joint Programming Initiative Water Challenges for a Changing World (Water JPI), the management of water resources in urban areas was identified as a primordial topic to be addressed and analysed.

The present mapping exercise and strategic recommendations to enhance research and innovation on the topic of urban water management builds on the ongoing cooperation between the EU and Brazil, the need to provide a defragmented view of a critically important area of scientific and

technological development, and to connect human resources and institutions of Brazil and the EU. The document presented herewith has been elaborated as a participatory and inclusive process, where research units under the umbrella of MCTIC were consulted from a thematic perspective as well as in the identification of relevant projects in this area.

The document follows a structure that respects both the independent developments made by the research and innovation communities from Brazil and from the EU, and the past and current collaborative projects where EU and Brazilian organisations have been involved. Global and water challenges are described, bridging the specific topic of urban water management, which constitutes the core of this report. A science policy context is provided, with the identification of recently implemented research and innovation agendas or directives, and how these reference documents relate to the theme.

Adding to the successful bilateral cooperation between Brazil and the EU, and aligned with the underlying objectives of:

- continuously strengthening the internationalisation of both the EU and the Brazilian scientific and technological systems;
- fomenting systems that promote a healthy circulation of highly qualified human capital;
- developing actions in Brazil that contribute to the strategic alignment on research and innovation agendas tackling challenges of common interest;
- stimulating the implementation of networks of networks, encouraging the sharing of common resources and infrastructures;
- leveraging nationally funded research and contribute to the defragmentation of knowledge,

a set of recommendations is established to maximize synergies and explore opportunities for both communities, which go beyond the sphere of urban water management, and may be applied universally to all domains of knowledge.

SUMÁRIO EXECUTIVO

Os Diálogos Setoriais são instrumentos e mecanismos de cooperação com o objetivo de desenvolver parcerias estratégicas entre a União Europeia e o Brasil com base nos princípios de reciprocidade, complementaridade e interesse mútuo. O Diálogo Setorial tem foco no estímulo a troca de experiências, conhecimento científico e tecnológico e melhores práticas em nível técnico e político para áreas estratégicas de interesse entre a União Europeia e o Brasil.

A organização de suporte logístico (Escritório Logístico-Facility) dos Diálogos Setoriais União Europeia Brasil, iniciou-se em 2007 com a finalidade de aprofundar relações bilaterais, e desenvolver diálogos setoriais em áreas de interesse mútuo com o objetivo de construir uma parceria estratégica entre a União Europeia e o Brasil. Atualmente em sua quarta fase de implementação, que abrange o período de 2017-2019, o suporte logístico reforça seu papel ao facilitar e apoiar esforços conjuntos para enfrentar desafios globais.

O Escritório Logístico-Facility é coordenado em conjunto pela Secretaria de Ger

1. FOREWORD

Brazil-EU/EU-Brazil Collaboration

The EU-Brazil bilateral cooperation was formalised in 1992 with the signing of a Framework Agreement, which entered into force in 1995, aiming at expanding, diversifying and stepping up cooperation in different strategic vectors, including science and technology.¹ In relation to the latter, the objectives outlined then are nowadays as pertinent as before, namely the need to:

- strengthen the links between the scientific and technological communities;
- encourage healthy mobility schemes of researchers;
- foster the relations between institutions and research centres;
- promote mutually beneficial transfers of technology;
- stimulate innovation and define the framework for cooperation in the field of applied science;
- jointly select priority areas.

Brazil and Europe have been mutually benefiting from different forms of cooperation since the 1960s, which have been particularly strengthened in the 1980s and coinciding with the inclusion of Portugal and Spain in the European Economic Community (the forerunner of the EU).^{2,3</}

greatly extending the national co-funding of Brazilian participation in projects under Horizon 2020, promoting cooperation between parallel projects under coordinated calls for proposals in Brazil and the EU, and twinning existing projects in areas of common interest.”⁹

These facts reflect the quality of the scientific and technological communities in Brazil, and highlight the importance of unlocking their potential to jointly address the most important missions one faces on a global scale, and to establish stronger links between both sides of the Atlantic.¹⁰

At this level, scientific diplomacy has also been crucial in the framework of the promotion and valorisation of knowledge and the consolidation of the bilateral relations between Brazil and the EU. The general recognition that the challenges we face today (climate change, oceans or health, for example) are inextricably linked to research and innovation or to the internationalisation and globalisation of the systems of higher education, science and technology, has contributed to the increased need to develop synergies between science policy and external policy. Research and innovation, or science and technology, set a privileged stage for Brazil and the EU to develop common efforts to maximise resources, to diminish knowledge fragmentation, but also to obtain individual competitive advantages for their economic and social growth. Thus, strategic endeavours must be taken to assure the compatibility and dynamic balance between the cooperative and competitive vectors, which will allow for a responsible knowledge production and dissemination and to the consolidation of the EU-Brazil partnership.</

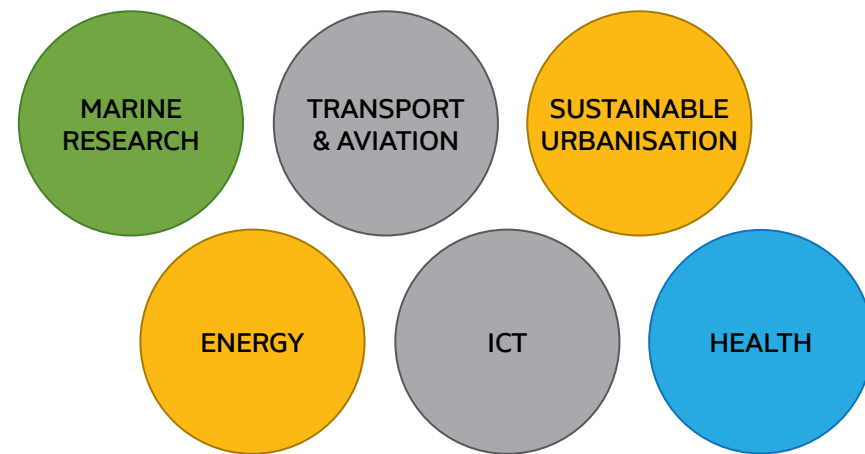


Figure 3. The EU-Brazil main targeted areas for RDI in order to develop national and regional research strategies, policies and programmes, and to produce and disseminate new knowledge and transfer of technology.

The Research and Innovation System in Brazil: a global perspective on the environment sector

The institutional organisation of Science in Brazil started in the last decade of the XIX century and the first decade of the XX century. Research Institutes in the areas of Agronomy, Public Health and Biology were established.¹² The main driving force for these developments was the demand to solve problems such as coffee production, public health and parasitology. Another important step in the institutionalisation of science in Brazil was the creation in 1916 of the Brazilian Academy of

Two new initiatives of extreme strategic importance were implemented in the years 2000 and 2001. One was the implementation of the Millennium Institutes by the Ministry of Science and Technology: 17 Institutes of high level were selected among 200 participants to be supported by substantial research grants. The total of resources invested was 100 M€ for a three-year period. These 17 institutes covered an ample range of science and technological areas. Further on, this programme was transformed in a vast project: the National Institutes of Science and Technology that today support 100 Institutes in several states of Brazil covering several priority areas of Science and Technology.¹⁷

The other important initiative was the creation of the Sectorial Funds for Research and Technology (2001) that consisted in the contribution of the private sector in several areas such as agriculture, energy, water resources, health or raw materials to research projects and technological development.¹⁸

Even recognising the existence of barriers that hampered more successful financial support of research in occasional years, the progress and the consolidation of the institutional organisation in Brazil has advanced considerably. Strategic long term goals are being set, namely the investment of 2% of the GDP in science and technology until 2025, and the increase in the number of scientists and engineers (per 1 million inhabitants) from 700 to 3,000.¹⁹ Another is the implementation of projects

- **Urban big data:** invest in urban intelligence laboratories and observatories devoted to implement and use data banks to evaluate water demands, water availability, and to improve planning actions and strategies at the urban level;
- **Urban ecosystems:** invest in the recovery of degraded ecosystems (urban watersheds) mainly at peri-urban regions via the use of ecohydrological approaches and bio-based solutions;
- **Urban forestry and water management:** develop urban forest parks to improve water management, and to adapt to climate alterations and extreme events, and protect urban biodiversity, by establishing public-private systems for their maintenance.

2. INTRODUCTION TO WATER CHALLENGES

Global Challenges and Water

With an **estimated population of 9.8 billion inhabitants by 2050**,²⁰ including 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.

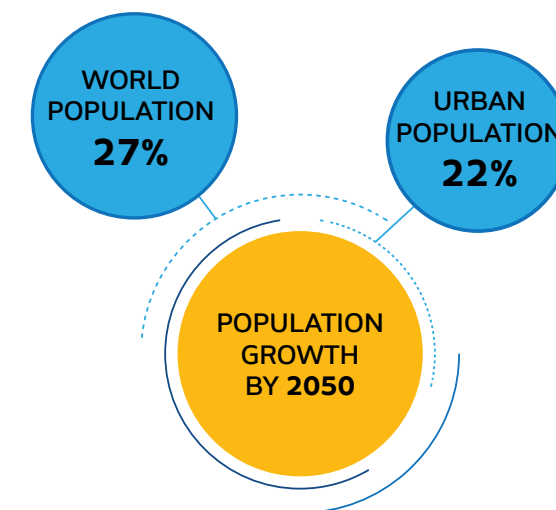


Figure 4. Global challenges: population growth by 2050 and the respective share that corresponds to population growth in urban areas.²¹

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

20. United Nations: <https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html>

21. <https://www.unwater.org/water-facts/water-food-and-energy/>. <http://www.fao.org/land-water/water/watergovernance/waterfoodenergynexus/en/>. <http://www.globalwaterforum.org/2012/05/21/water-outlook-to-2050-the-oecd-calls-for-early-and-strategic-action/>. <https://www.worldenergy.org/assets/images/imported/2016/10/World-Energy-Resources-Full-report-2016.10.03.pdf>.

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.^{22,23}

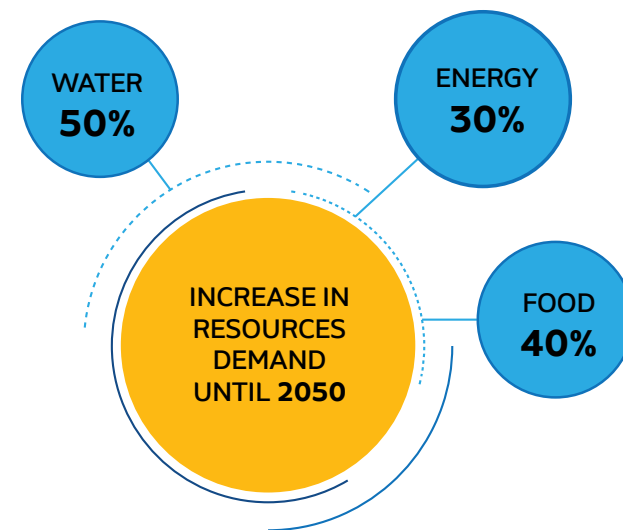


Figure 5. Global challenges: increase in resources demand by 2050 and the respective share that corresponds to water, energy and food.

urban infrastructure systems to address the growing challenges associated to urban water security and urban water demand.

Water Challenges

Water is a basic requirement for life, and it is central to numerous systems, namely the industrial, economic, environmental, societal, or political. As a precious natural resource, it constitutes a fundamental challenge to protect it both in terms of quantity and quality, and to foster responsible research and eco-innovation under climate change adaptation.

To this end, it is pivotal to raise public awareness on water use, to simultaneously foster economic growth and create jobs in all water sectors, and to set adequate prices on water services. The latter relates both to the complexity associated to water infrastructures and the fact water covers such a wide range of activities. It is then critical to address the challenges related to water valorization, to define compatible strategies between the investment needed to renovate aging infrastructures and mitigate risks related to water security and extreme natural events, and the pace technology develops in this area. The issue of water security may be considered as a primary challenge, in relation to water abstraction for agriculture and industry, to extreme events such as floods and droughts, to water-dependent energy demand, and to the pollution of surface and groundwaters.

Linked to the water efficiency topics the challenge of giving water its value within a context of green and circular economies, highlighting its importance to global socioeconomic development and to green growth, and the objectives of i) stimulating the industrial sector to water reuse and recycling, ii) address the interconnections between water-energy-food-land-use, and iii) foster innovation in the agriculture sector. The water-health nexus is particularly prevalent in most international research and innovation agendas, with the identification of emerging pollutants, the minimization of micropollutants in the environment, and the monitoring of the health-related risks being object of extensive collaborative efforts.

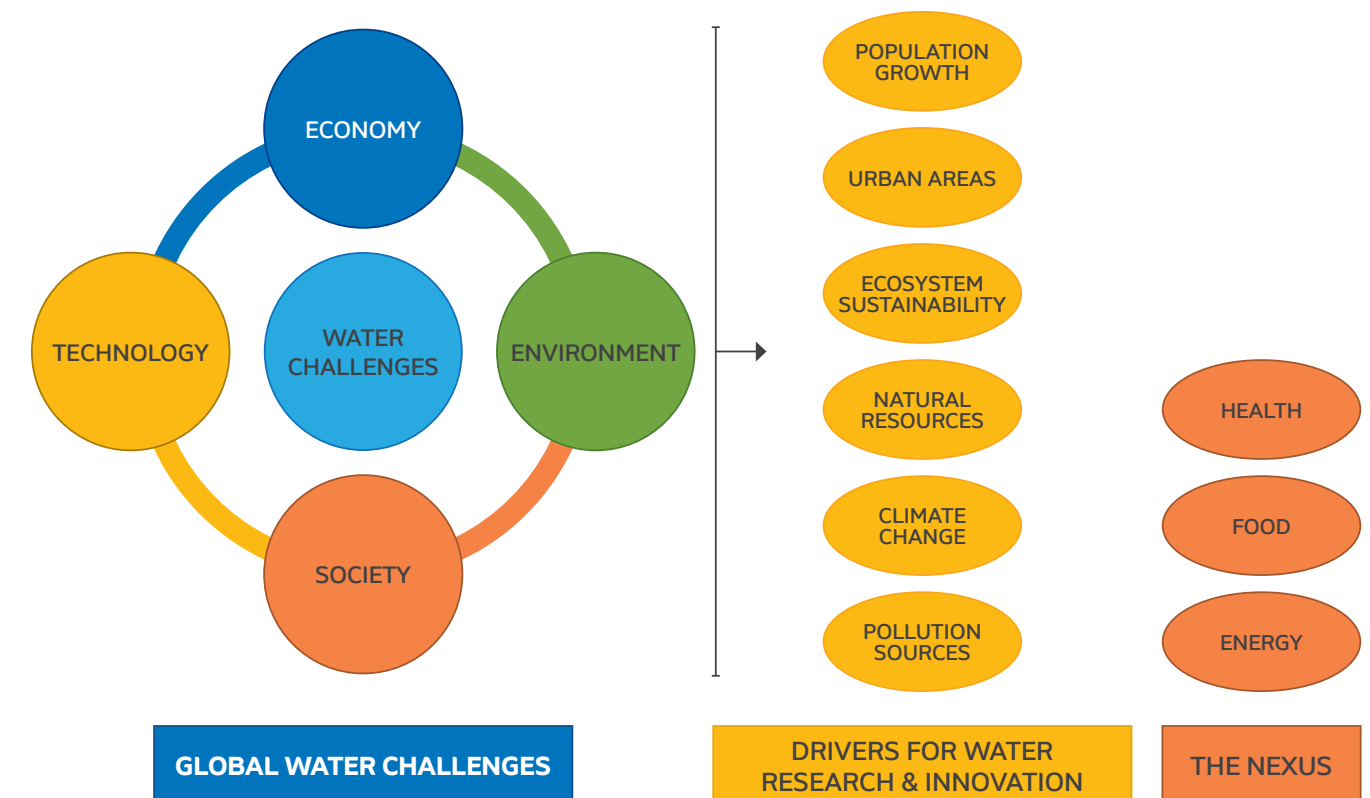
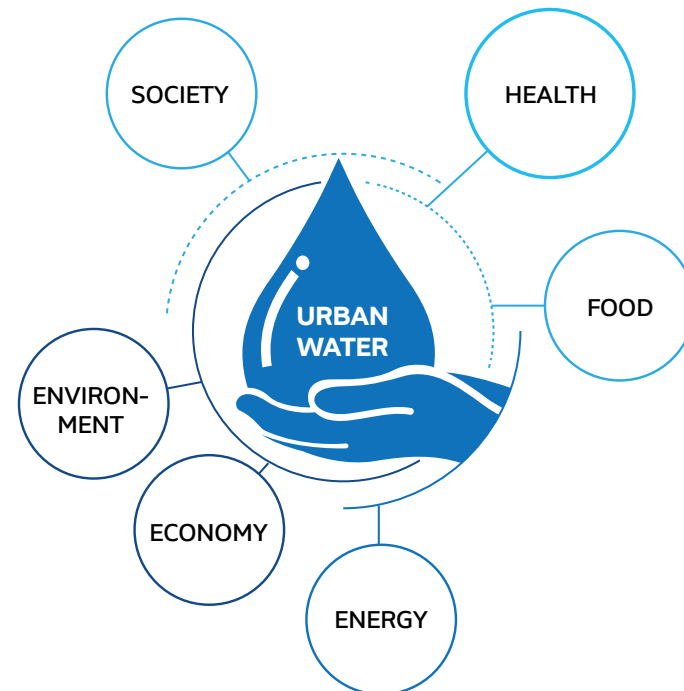


Figure 6. The main vectors related to the global water challenges, namely the economy, environment, technology and society. How these vectors relate to the main drivers for research and innovation in the water domain, and the health-energy-food nexus that provide an umbrella for producing and disseminating new knowledge and technological developments in this area.

3. INTRODUCTION TO URBAN WATER MANAGEMENT

Urban Water Management

Urban water management encloses a wide range of research and innovation topics with strong implications in the economic, environmental, societal and cultural sectors. The horizontal nature of this theme is associated to an inherent complexity of combining scientific and technological knowledge and to assure it is applied sustainably, namely on a dynamic equilibrium between economic growth, quality of life, and the environment (Figure 7). 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.



measures and sectoral policies, including rural development, land use, food security, management of other natural resources, and the provision of public services. At the core of urban water management is the strengthening of the strategies for urbanisation and territorial planning, which in turn need to be articulated with the implementation of sustainable water management systems, public water and sanitation utilities, and urban infrastructure services. Connected to these topics, with particular emphasis to developing regions, it is primordial to promote universal and equitable access to safe and affordable drinking water and adequate and equitable sanitation and hygiene for all, which are the main target of SDG 6 of the 2030 Agenda.





Figure 9. Tackling global urban water challenges through EU-Brazil and Brazil-EU cooperation in science, technology and innovation.

Urban Forestry and water management

Urban forest areas are an important development in cities, as they protect urban biodiversity, promote recharge of aquifers, and contribute to improve air quality of urban areas. They also constitute an important component on the adaptation of cities to the effects of global

by conventional wastewater treatment. The excessive use of antibiotics in health and agriculture contribute to the development of multi resistant bacteria strains. These pollutants occur mostly as complex mixtures that have synergistic, additive, and antagonistic effects on human health and on the environment. These organic compounds may undergo chemical and biological degradation which generates several and diverse metabolites that are often of unknown composition and impact.

Technical advanced measurements and monitoring of these micropollutants are needed. These measurements will be especially important in urban regions and in the effluents of the wastewater treatment stations, and of course the urban rivers themselves.

Improving risk assessment for micropollutants may form the basis for a scientifically sound, contaminant-directed management. A classification of micropollutants based on their chemical proprieties (metals, PCBs-polychlorinated bifenils), their function (usage: pharmaceuticals, agrochemicals) or public awareness (emerging persistent, organic pollutants) will be useful for assessing their fate, controlling their release, and the general dissemination of public information.

Innovative approaches should be developed to identify and mitigate the effects of environmental contaminants. Since there is a large number of micropollutants and their various potential effects on the biota and human health, it is important to understand their

In order to achieve city resilience, urban water management should be integrated into the watershed concept. Specific decision support systems are needed since this has to be adapted to local needs and challenges. All relevant links between water-related processes should be considered in the models that promote decision support systems. New model concepts that integrate bio-geo-physiographical analysis articulated with social and economic evaluations are essential. Basic components of decision support systems have to be implemented for each urban area. ICTs make possible the participative governance, as users become an active agent for the development of new processes and city configurations.

Some European cities are developing projects with the implementation of living labs following these concepts: Ghent (Belgium), Manchester (United Kingdom); Copenhagen (Denmark)³³ Technologies aggregating real time monitoring of environmental parameters (climate, air pollution, water pollution) connected and articulated with other information data on water supply, energy, mobility, education, public security, provide and promote a large amount of data that have to be processed and analysed accessing new and advanced technologies. Intelligent offices from city administrative services should operate these advanced programmes integrating data and qualified personnel.

Water environmental challenges: political and social awareness.

Global and Transnational Strategic Agendas

The strategic documents adopted in the post-2015 era have been naturally influenced by the United Nations 2030 Agenda for Sustainable Development (**2030 Agenda**), not only from the thematic point of view, but also in relation to the timeline for its implementation. Sustainable urban development and water security has been in the forefront of EU priorities, and several member state driven initiatives have derived from the 2030 Agenda, and in particular, from the Sustainable Development Goal 11 “Make cities and human settlements inclusive, safe, resilient and sustainable” and SDG 6 “Ensure availability and sustainable management of water and sanitation for all”, which are at the core of this report.

It is not possible to dissociate European agendas from global international strategies, particularly those in the sphere of the United Nations. Thus, besides the abovementioned 2030 Agenda, it is important to highlight:

- The UN-Water platform, which coordinates the efforts of UN entities and international organisations working on water and sanitation issues. Annual

of the EU, its national policies and legislation. The main pillars and drivers: Regulation, Funding and Knowledge. Several partnerships have been defined since 2016: Inclusion of Migrants and Refugees; Air Quality; Housing; Urban Poverty; Circular Economy; Digital Transition; Urban Mobility; Jobs and Skills in the Local Economy; Energy Transition; Climate Adaptation; Innovative and Responsible Public Procurement; Sustainable Use of Land; Nature-Based Solutions;

- **European Urban Initiative (EUI) post-2020**,⁴⁰a new instrument providing coherent support for cities that builds on all thematic priorities of the Urban Agenda for the EU (UAEU) and covers all urban areas. This initiative aims to strengthen integrated and participatory approaches to sustainable urban development and provide a stronger link to relevant EU policies, and in particular, cohesion policy investments. It will do so by facilitating and supporting cooperation and capacity building of urban actors, innovative actions, knowledge, policy development and communication in the area of sustainable urban development. The proposed EUI is aligned with the Urban Agenda for the EU;
- **Urban Water Agenda 2030**(under implementation) is a joint initiative of the European Commission and local governments to safeguard Europe’s water resources and strengthen the implementation of European Union water policies by fostering

Document Reference	Title	Year	Objective
2006/7/EC	Bathing Water Directive	2006	The management of bathing water quality and repealing Directive 76/160/EEC.
2006/118/EC	Groundwater Directive	2006	Protection of groundwater against pollution and deterioration.
98/83/EC	Drinking Water Directive	1998	Improve the quality of drinking water. Proposal for a revised drinking water directive approved in February 2018.
2007/60/EC	Flood Risks Directive	2007	Establish a framework for the assessment and management of flood risks, aiming at the reduction of the adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods in the Community.
91/676/EEC	Nitrates Directive	1991	Protection of waters against pollution caused by nitrates from agricultural sources.
2013/51			

Overall Key Messages from an European Perspective

The above section on strategic agendas and current European legislation encompasses a series of key messages, which are in their essence common to Brazilian social, economic, technological and cultural development:

- **Smarter Europe** (innovation, digitization, information organization, economic transformation);
- **Greener, carbon-free Europe** (energy transition, resource efficiency management, and climate change adaptation);
- **Connected Europe** (sustainable mobility and digital networks);
- **Social Europe** (general well-being, quality in employment, education, and inclusion);
- **Europe closer to citizens** (locally-led development strategies, effective implementation of legislation, information dissemination, and sustainable urban development);

Brazilian Legislation

In January, 1997 the Water Law was created by the Federal Government of Brazil (Law 9

4. RESEARCH AND INNOVATION ON URBAN WATER MANAGEMENT WITHIN THE EU

The Joint Programming Initiative Water Challenges for a Changing World

The Water JPI is an intergovernmental initiative, which started in 2011, and currently comprising twenty-three partner countries and three countries as observers, and its membership accounts for 88 per cent of all European public RDI annual expenditure on water issues. Several projects support the Water JPI activities, and as mentioned earlier, 5 Joint Transnational Calls have been implemented over the last 5 years.

The first Joint Call (2013) with a total budget of € 9 million focused on “Emerging water contaminants-anthropogenic pollutants and pathogens” and 7 transnational collaborative research projects in the field of water quality have been recommended for funding, involving institutions from 10 European countries.

The Joint Calls that followed (2015, 2016 and 2018) have been implemented under the Cofund mechanism, where the European Commission contributes financially

helps keep the urban water clean and healthy and enhance the recovery and reuse of resources like water and nutrients. This project includes Brazil as partner(more information in Chapter 3)⁵⁴;

- FRAME, a novel framework to assess and manage contaminants of emerging concern in indirect potable reuse aiming at developing an overall evaluation procedure enabling a comprehensive assessment of efficient and cost-effective indirect potable reuse (INPR) measures to minimize the risks associated with emerging chemicals and microbial contaminants, while closing local and regional water cycles;
- INXCES, IMDROFLOOD, MUFFIN, are all projects tackling the challenge of climate change adaptation, and in particular the forecasting and early warning of extreme events such as floods and droughts. The projects aim at improving the mitigation of the impact of extreme events in light of ongoing urbanisation, implementing a holistic spatial and temporal approach to the urban water balance at a catchment scale (keywords: assessment, mitigation, city resilience, nature-based solutions, extreme hydroclimatic events);
- ENTRUGO, NEWTS are projects aiming at enhancing trust in government through effective water governance strategies, and on the other hand on different approaches (nudges *versus* education, legislation or enforcement);

approaches for local knowledge co-creation and participation through Urban Living Labs;

- CRUNCH⁵⁷ investigates the food-water-energy nexus complexity as a single system, combining an integrated decision support system and visualisation models, working closely with local stakeholders;
- DESCIPHER⁵⁸, on integrated nature-based solutions within airshed and river basin management. It will address the issues related to sustainable urbanisation under climate change, and its relation to air, soil and water quality, evaluating the consequences for ecosystem services;
- ENLARGE⁵⁹ stands for enabling large-scale adaptive integration of technology hubs to enhance community resilience through decentralized urban food-water-energy nexus decision support;
- FEW-METER⁶⁰, on the development of an integrative model to measure and improve urban agriculture towards circular urban metabolism. Farmers will measure the efficiency of urban agriculture case studies in five developed countries by quantifying usage of energy, water and other resources as well as production of produce and compost;
- FLOODCITISENSE⁶¹, FLOODLABEL⁶², GREEN BLUE CITIES⁶³ addressing the topic of urban floods, in different dimensions, namely the development of early warning services, or by combining storm water management with multi-functional green infrastructures, or

economics. It deals with the implementation of nature-based solutions for sustainable urbanization, including urban water management. A snapshot at water challenges and the resilience of urban areas has been elaborated recently.⁷⁷

EU-India Cooperation

The European Union, the Department of Science & Technology and the Department of Biotechnology of India funded seven projects, starting in 2019, that have been selected under the EU - India Joint Call on Research and Innovation for Water.⁷⁸ It comprises the urban and rural dimensions and they are expected to tackle the most prominent and urgent water challenges in India. This joint collaborative effort is under the umbrella of the EU-India Water Partnership signed in 2016.⁷⁹

Australia: The Cooperative Research Centre for Water Sensitive Cities (CRCWSC)

The CRCWSC is an Australian research centre that brings together many disciplines, world-renowned subject matter experts, and industry thought leaders who want to revolutionize urban water management in Australia and overseas.⁸⁰

Table 2 –The ESFRI roadmap of 2018 and research infrastructures related to the water sector.

ESFRI-RI	Status	Preparation/ Implementation	Operation Phase	Name/Topic
DANUBIUS-RI	Project	2012-2022	2022	The International Centre for Advanced Studies on River-Sea Systems
ERINHA	Landmark	2010-2017	2018	European Research Infrastructure on Highly Pathogenic Agents
ESS ERIC	Landmark	1996-2012	2013	European Social Survey

In simple terms, research infrastructures provide the tools, resources, and also collaborative sites where researchers and innovators can jointly develop curiosity-driven science or apply the generated knowledge and related-innovative concepts to cause a direct positive impact on

Table 3 – Ongoing COST Actions which are related to urban water management.

Ongoing COST Actions related to urban water management			
Action Acronym and timeline	Action Title	Number of COST Countries	International partners
CA18225 (2019–2023) ⁸⁶	Taste and Odor in early diagnosis of source and drinking Water Problems	32	
CA17133 (2018–2022) ⁸⁷	Implementing nature based solutions for creating a resourceful circular city	39	Colombia, Taiwan
CA15206 (2016–2020) ⁸⁸	Payments for Ecosystem Services (Forests for Water)	33	China, New Zealand, Japan

86.

- Smarter Cities;
- Renewable Energy;
- Precision Farming;
- FinTech (Financial Technology);
- Reduction of Emission, including agricultural emission.

FAPESP and the IFD expect to jointly fund maximum four projects with a total amount (sum of costs charged to FAPESP and the IFD) of around €2.500.000,00 (Two million and five hundred thousand Euros) for all projects.¹⁰¹

101. <https://innovationsfonden.dk/da/programmer/international-collaborations/call-proposals-strategic-research-collaboration-state-sao>

6. BRAZIL-EU SYNERGIES AND OPP

7. ANNEXES

Brazil-EU Cooperation on UWM: a series of projects of reference

Project Title (Project Acronym)		
Smart integrated multitrophic city food production systems – a water and energy saving approach for global urbanization (CITY FOOD)		
Project Topic		
Feeding rapidly growing urban populations requires innovative solutions that ensure efficient water, energy, and nutrients management. CITYFOOD investigates quasi-closed loop integrated aqua-agriculture (IAAC) systems to address this global challenge.		
Project Start Date	Project End Date	Project ID and Programme
2018-04-01		

Project Title (Project Acronym)		
Urbanizing in Place. Building the food water energy nexus from below (URBANISING IN PLACE)		
Project Topic		
Agroecological urbanism; Model of urbanization which places food, metabolic cycles and an ethics of land stewardship, equality and solidarity at its core; identify ways of structuring urbanization that value proximity, account for the reproduction of nutrients and soils, mobilize technologies and decommodified value chains in order to keep the control over resources localized.		
Project Start Date	Project End Date	Project ID and Programme
2018-03-01	2021-02-28	Project ID: 11326801
Project Information		
<		

Project Title (Project Acronym)		
Globally and Locally-sustainable food-water-energy innovation in Urban Living Labs (GLOCULL)		
Project Topic		
Develop an Urban Living Lab approach for innovations in the FWE nexus that are locally and globally sustainable. To support future implementation of this approach, guidelines and a participatory assessment tool kit will be developed through co-creation in seven Urban Living Labs based on an integrated assessment of local-global interactions in the FWE nexus and transdisciplinary action-research.		
Project Start Date	Project End Date	Project ID and Programme
2018-03-01	2021-02-28	Project ID: 11127096
Project Information		

Project Title (Project Acronym)		
Research-based Assessment of Integrated approaches to Nature-Based solutions (RAIN SOLUTIONS)		
Project Topic		
Close the demand and supply gap in terms of quantity and quality of water resources; develop an integrated framework of methodologies to manage nature-based solutions (NBS) for the restoration and rehabilitation of urban water resources systems		
Project Start Date	Project End Date	Project ID and Programme
N.A. (recently approved)	N.A.	Project ID: WaterJPI-JC-2018_11
Project Information		

Project Title (Project Acronym)		
Digital-enabled green infrastructure for sustainable water resources management (DIGIRES)		
Project Topic		
Adapted technical infrastructure systems; Citizens participation; Regional/urban water resources management		
Project Start Date	Project End Date	Project ID and Programme
2019-01-01	2021-12-31	Project ID: ERANet17/ICT2-0196
Project Information		
		

Project Title (Project Acronym)		
Tools for Mapping Human Exposure to Risky Environmental Conditions by means of Ground and Earth Observation Data (EOXPOSURE)		
Project Topic		
Big Data; Monitoring Tools; Risk Exposure; Earth Observation		
Project Start Date	Project End Date	Project ID and Programme
2017-03-01	2021-02-28	Project ID: 734541 Programme: H2020-EU.1.3.3.
Project Information		
https://cordis.europa		

Project Title (Project Acronym)		
Role Of Biodiversity In Climate Change Mitigation (ROBIN)		
Project Topic		
Tropical Forests and Climate Change Mitigation; Ecosystem Services; Biodiversity and Socio-Ecological Processes; Big Data.		
Project Start Date	Project End Date	Project ID and Programme
2011-11-01	2015-10-31	Project ID: 283093 Programme: FP7-ENVIRONMENT
Project Information		
https://cordis.europa.eu/project		

Project Title (Project Acronym)		
Comprehensive Modelling of the Earth System for better Climate Prediction and Projection (COMBINE)		
Project Topic		
Earth System Models (ESMs);Climate Projections; Climate and Climate Change Predictions; Social and Economic Impacts; Carbon and Nitrogen Cycle; Water Availability.		
Project Start Date	Project End Date	Project ID and Programme
2009-05-01	2013-03-31	Project ID: 226520 Programme: FP7-ENVIRONMENT
Project Information		
https://		

Project Title (Project Acronym)		
Telemonitoring and Advanced Telecontrol of High Yield Wastewater Treatment Plants (TELEMAC)		
Project Topic		
Remote Wastewater Treatment Management; Depollution Systems; Sensor Development and Advanced Control Systems; Database Management.		
Project Start Date	Project End Date	Project ID and Programme
01-09-2001	31-12-2004	Project ID: IST-2000-28156 Programme: FP5-IST
Project Information		
https://cord		

