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INN WATER

Promoting social innovation to renew multi-level and cross sector water governance

D2.1: Enhanced water governance assessment tool

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Delivery date: 30/08/2024

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Project Consortium

EXECUTIVE SUMMARY

Developed by a diverse community of over 100 stakeholders from 30 countries, the OECD water governance principles were adopted in 2015 and have been applied globally. They address roles and responsibilities (Principle 1), integrated basin management (2), policy coherence (3), capacity adaptation (Principle 4), data production (5), water finance (6), regulatory frameworks (7), innovative practices (8), integrity (9), stakeholder engagement (10), trade-offs (11), and monitoring (12). Deliverable (D) 2.1 from Work Package 2 aims to develop methodologies for assessing water governance, addressing technical, policy, and institutional challenges (*e.g.*, polluter pays principle (Art. 9 WFD), 2030 Biodiversity Strategy's restoration of freshwater ecosystems, EU Green Deal). D2.1 builds upon the OECD Water Governance Principles and enhances them by incorporating sustainability and resilience dimensions, focusing on circular economy, environmental resilience, engagement of vulnerable groups, and integrated local strategies.

The circular economy approach emphasizes minimizing water pollution and over-abstraction through innovative reuse strategies, aligning with EU directives for sustainable resource management. Local empowerment underscores the role of decentralized governance in promoting water conservation and resilience, particularly crucial as urbanization increases. Engagement of vulnerable groups emphasizes inclusivity in water governance, addressing gender disparities and socio-economic inequalities to enhance environmental outcomes. Environmental resilience is highlighted for its role in adapting to climate impacts and protecting biodiversity, integrating ecosystem conservation into governance frameworks.

The developed assessment tool will be tested in EU pilot sites to refine both the water governance tool and process. It involves a thorough process encompassing preparation, assessment, and gap identification phases. Lead institutions, facilitated by WP2 partners, engage stakeholders from diverse backgrounds in workshops to gather qualitative and quantitative data. Results are presented using color coding and visual graphs to highlight key water governance challenges and areas needing improvement.

Document information

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Related deliverables

This Deliverable is especially linked to the *Deliverable 4.1 Water governance diagnostic tool*, since the content of this D2.1 will be used to create the tool.

It is also linked to the *Deliverable 2.2 Innovation in water governance: Reference Guide for Programming*, which aims to identify and characterize effective governance practices and solutions, since the last one bases its structure and best practices on the water governance principle that D2.1 highlights.

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ACRONYMS

CA	Consortium agreement
D	Deliverable
EC	European Commission
GA	General Assembly
OECD	Organization for Economic Cooperation and Development
PS	Pilot sites
SC	Steering Committee
SDG	Sustainable Development Goal
UN	United Nations
WFD	Water Framework Directive
WP	Work Package

GLOSSARY

Circular economy — To extend the life cycle of products and resources, including water, by using a model of production and consumption based on reducing, reusing, recycling existing materials and products for as long as possible, at different levels of governance and across sectors, as well as ensuring closed loop material flows.
Climate neutrality — To achieve net zero greenhouses gas emissions.
Inclusion – practice or policy of providing equal access to opportunities and resources for people who might otherwise be excluded or marginalized.
Natural resource management — How natural resources, including land, water, soil, plants, and animals are managed and influence quality of life.
Resilience – The ability of a system to adapt, anticipate and respond to system perturbations.
Stakeholders — A person, group of people, organization with an interest or concern in something.
Sustainability – Meeting the needs of the present without compromising the ability of future generations to meet their own needs.
Water governance — The range of political, institutional and administrative rules, practices and processes (formal and informal) through which decisions are taken and implemented, stakeholders can articulate their interests and have their concerns considered, and decision makers are held accountable for water management.

1. INTRODUCTION

InnWater is a three-year European project started in March 2023. Its aim is to promote social innovation to renew multi-level and cross sector water governance associated with economic and financial mechanisms that support the EU Green Deal transition while ensuring water systems sustainability. InnWater brings together 13 partners with different expertises and stakeholders from 5 countries (France, Italy, Spain, UK, Hungary).

1.1 Objective of Work Package 2

InnWater's Work Package (WP) 2 oversees developing the methodological, and practical approaches for assessing water governance and identifying practices at different geographical scales to improve water governance in the project's pilot sites and beyond. WP2 will create a framework for performing a **governance assessment** that directly feeds into options, opportunities, and actions to promote effective integration across sectors (e.g., water, energy, agriculture, and urbanisation) and enhance resilience and sustainability of water systems. Said framework will allow us to analyse the technical, policy, and institutional challenges for achieving **"good" water governance** by complementing and expanding upon the OECD's principles on Water Governance, in line with EU policy priorities.

The aim of Task 2.1 is to provide an enhanced methodology for water governance assessment based on the OECD Principles on Water Governance, which focus on **effectiveness** (institutions and policies), **efficiency** (data, financing, regulations), and **trust and engagement** from stakeholders. To produce this enhanced methodology, a literature review of a) existing assessment frameworks for Water Governance, b) non-academic documents and c) academic papers has been conducted, and is further described in section 2.2 of this document. Based on the outcomes of this literature review, the OECD Water Governance framework was enhanced by the inclusion of complementary aspects focusing on **sustainability** of water management, defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (UN, 1987), and **resilience** of water management, defined as the ability of a system to adapt, anticipate and respond to system perturbations.

These two dimensions which are further discussed in section 2 of this document, have been embedded into the water governance assessment tool produced and presented in section 4. In particular, they are reflected in the themes of *i)* **circular economy**, *ii)* **environmental resilience**, *iii)* **engagement of vulnerable categories**, and *iv)* **integrated strategies and local empowerment**. The four themes were selected as the common denominators between what policy makers report as existing issues and what researchers deem as fundamental factors to ensure a water governance that is economically, environmentally, socially sustainable and resilient. By integrating these four themes within the existing OECD framework, based on the twelve efficiency-effectiveness-trust and engagement water governance principles, we contribute to the applied research by providing a tool that encompasses the gaps mentioned in the literature; that is empirically applicable at various scales; and that allows for an assessment that addresses current mega trends and water risks affecting water management in Europe, and the world.

In the enhanced water governance assessment tool, which takes the form of a **detailed questionnaire** encompassing the various dimensions of water governance (as described in section 2.1), special attention was given to the objectives of restoring **freshwater ecosystems** (as required by the 2030 Biodiversity Strategy) and the **polluter-pays principle** (Art. 9 WFD), in the broader perspective of the EU Green Deal transition. Some guidance and recommendations were also produced regarding the water governance assessment process and the use and implementation of the assessment tool (see section 3 of this document). All these elements will feed into the creation of a digital water governance assessment tool as part of task **4.1** (Water governance diagnostic tool). This enhanced water governance assessment methodology will then be tested in each Pilot Site to characterize and assess their current water governance status and gaps (T**5.1,** Preliminary pilot sites implementation guidelines). The feedback provided will help fine-tune the methodology and tool for use in replication sites (T**6.3,** Communication and dissemination report and monitoring). Task **2.1** (Enhanced water governance assessment tool) will also bring some inputs into Task **2.2** (Innovation in water governance: Reference Guide for Programming) which aims to identify and characterize effective governance practices and solutions. Figure 1 below summarizes the interaction of Task 2.1 with other tasks and work packages.

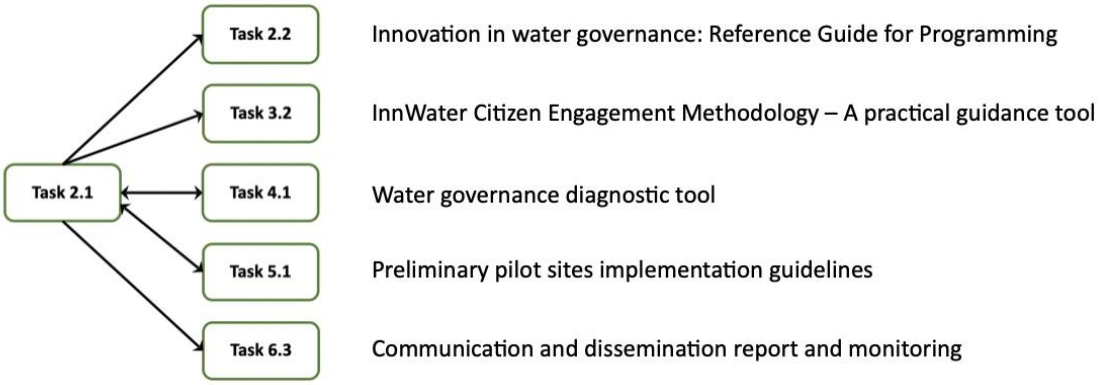


Figure 1: Tasks involved for water governance assessment tool

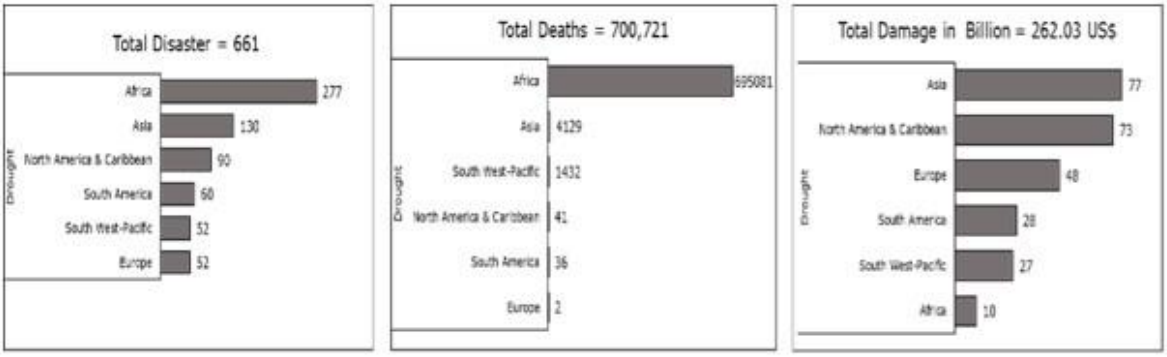
This research paper is structured as follows: Section 1 introduces the objectives and content of the deliverable, while providing a contextual framework of issues related to water governance. Section 2 illustrates the methodology used, including the reference to the OECD framework and a literature review of academic and non-academic output. In this section, we also present the results of our theoretical analysis and the new topics investigated in the enhanced framework. Section 3 provides guidance on conducting the assessment. The questionnaire is illustrated in detail in Section 4.

1.2 Water governance as a means to address water risks and strengthen water security

Communities all over the world are currently facing the consequences of several mega trends characterized by their global scale, significant and long-lasting impacts. Over the past 25 years, world **population increased** by 2.1 billion people. This population growth led to an increased water demand thus putting more pressure on water resources both in qualitative and quantitative terms. With about 54% of the world population living in urban areas, and 75% in the EU, **urbanization** is increasing the demand for access to safely managed water and sanitation services while urban areas are generating 80% of the global GDP.

In parallel, **climate change** impacts also exacerbate the risks of "too much", "too little", "too polluted" water and degraded water ecosystems. On the one hand, Earth's temperature has risen by 0.08° Celsius every ten years since 1880, with the warming rate becoming twice as fast (0.18° C) since 1981. On the other hand, precipitations are significantly dropping. Between 50°S–50°N, the decrease observed amounted to 7% between 1998 and 2016 (Benestad, 2018). The wind has also changed patterns, with '**global stilling**' periods of slow wind alternating with high-speed winds, ultimately affecting waves and tides. Because of key trends in climatic variability, some water risks are increasing, affecting water security.

Since 2000, **droughts** have increased by 29% in number and duration, causing around 650,000 deaths all over the world between 1970 to 2019 and USD 124 billion in economic losses between 1998 and 2017 (Figure 2). On this subject, large increases of **multi-year droughts** in North-Western Europe in a warmer climate are expected in the future (van der Wiel et al., 2023).



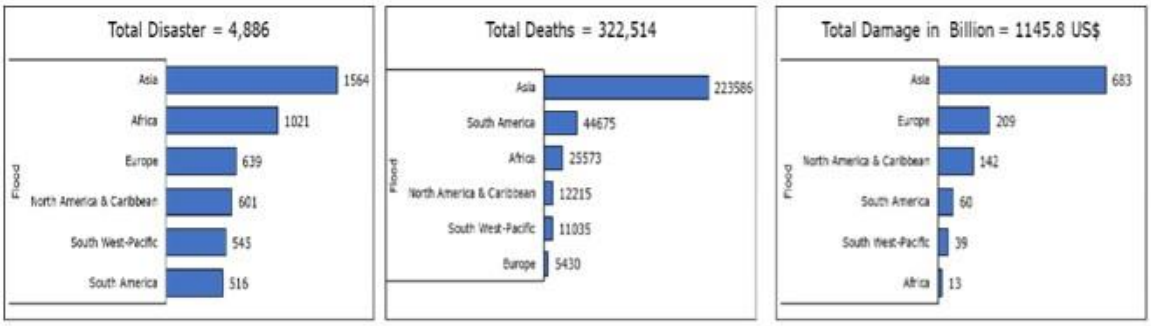
Distributions of drought-related disasters and related losses by region, 1970-2019 (WMO/CRED)

Figure 2: Drought-related disasters

In the EU, about 30 % of the population is affected by water stress during an average year (European Environment Agency, 2021) while 29% of the EU 27 territory was affected by water scarcity during at least one season in 2019. In general, water scarcity is more common in southern Europe, where approximately 30 % of the population live in areas with permanent water stress (Figure 3) and up to 70 % of the population live in areas with seasonal water stress during summer (European Environment Agency, 2023).

Figure 3: Water stress hotspots in the world

As another consequence of climate change, **floods** are becoming more frequent. In 2020, more than 34 million people globally were affected by floods (Figure 4). In Europe, "flooding affected 0.03% of [the] population per year on average between 1870 and 2016, and generated losses equal 0.08–0.09% of GDP" (Paprotny & al., 2018). New strategies for handling rising river flood risk in Europe are, therefore, required (Dottori et al., 2023).



Distributions of flood-related disasters and related losses by region, 1970-2019 (WMO/CRED).

Figure 4: Flood-related disasters

In this context, the potential monetary impact of water risks on the global economy (Figure 5) has been estimated to hundreds billion dollars compared to a much lower cost of responses (World Water Forum, 2022).

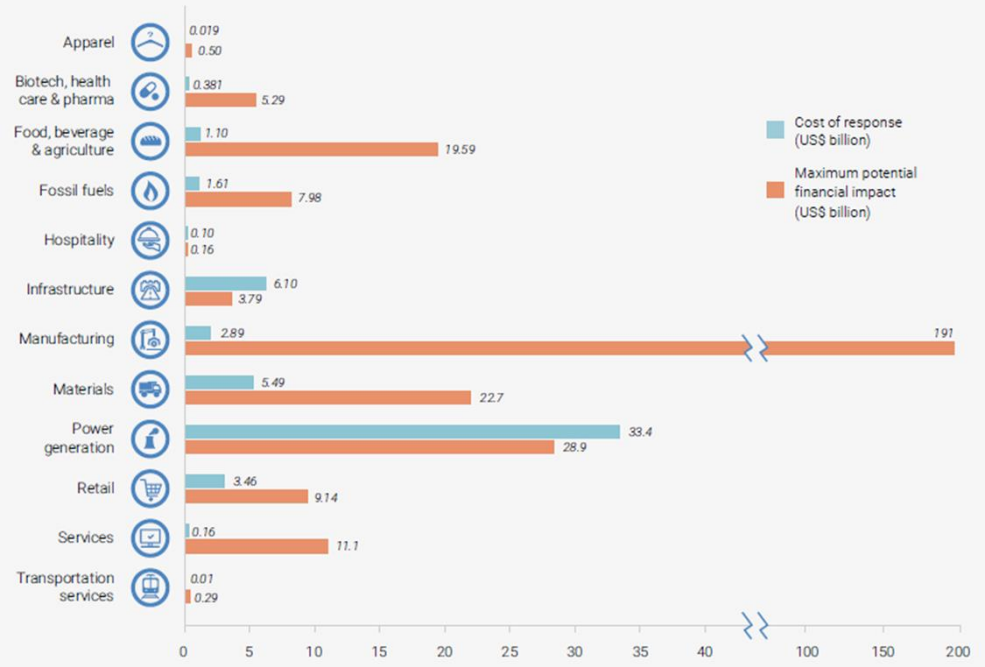


Figure 5: Monetary impact of water risks in the world. Source: World Water Forum, 2022.

Resilience is a critical component to cope and adapt to climate change impacts, and water risks more broadly. The concept of resilience is understood as the ability of systems and stakeholders to cope, survive and thrive in the face of shocks and stresses, and adequately mitigate the impact on the system, along with ensuring consistent, adequate and high-quality water services for all its inhabitants and protect their well-being (CWRA, 2019).

Resilience is integrated in the goals and objectives of the global agenda, namely in the Sustainable Development Goals, Paris Agreement, Sendai Framework for Disaster Risk Reduction (SFDRR). For instance, several goals and targets of SDG emphasizes on fostering resilience in context to making cities, and human settlements inclusive, safe, resilient and sustainable; or having sustainable and resilient infrastructure development, among others. The Article 7 (1) of the Paris Agreement states that "Parties hereby establish the global goal on adaptation of **enhancing adaptive capacity**, **strengthening resilience** and **reducing vulnerability** to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response". The Goal of SFDRR is to "prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus **strengthen resilience**."

Sustainability, on the other hand, assumes that resources are finite and that they must be used purposefully to ensure there is enough for future generations. Sustainable choices in water governance mean that attention is drawn to **quality of water, levels of pollution in water, mechanisms to treat wastewater, and environmental protection**. By focusing on resilience and sustainability, water governance increases its ability to *i)* overcome water risks, especially in connection with threats linked to climatic variations (e.g., floods) and the degradation of our

biodiversity, as well as *ii)* ensure water security for communities that do not benefit from resilient infrastructures (e.g., non-contaminated drinking water), while enhancing that of communities experiencing the green transition.

The **OECD** argues that "water crises are often primarily **governance crises"** (OECD, 2015). Water governance, defined as "the range of political, institutional and administrative rules, practices and processes (formal and informal) through which decisions are taken and implemented, stakeholders can articulate their interests and have their concerns considered, and decision makers are held accountable for water management", is ultimately a means to an end. The OECD Water Governance Principles underlines that "coping with current and future challenges requires robust public policies, targeting measurable objectives in pre-determined time-schedules at the appropriate scale, relying on a clear assignment of duties across responsible authorities and subject to regular monitoring and evaluation. Water governance is a powerful means to achieve this end, and thus strengthen water security, as it can greatly contribute to the design and implementation of such policies, in a shared responsibility across levels of government, civil society, business and the broader range of stakeholders who have an important role to play alongside policymakers to reap the economic, social and environmental benefits of good water governance". Using a **multi-level and cross sector approach** means connecting actor groups with different types of knowledge systems so as to create common policies 'in the face of uncertainty and surprise' (Folke et al., 2005). Levels can be vertical (*i.e.*, stakeholders at different scales) and horizontal (*i.e.*, institutions within the same level of governance).

In order to provide solutions and address water risks in the context of megatrends like the ones mentioned above, an effective water governance assessment is required to guarantee that **policy goals and targets are achieved** (effectiveness), **benefits of water management are maximized** (efficiency), and that **water governance remains inclusive and fair** (engagement). From the analysis of academic and non-academic literature, as well as of institutional reports and EU directives, we identified a knowledge gap with respect to **environmental resilience**, **circular economy**, **local empowerment**, and **the engagement of vulnerable groups**. Questions related to these topics were integrated with pre-existing questions typical of the original OECD Water Governance Framework to produce a new enhanced water governance assessment tool.

2. METHODOLOGY

2.1 Water governance framework

➢ *Using the OECD Principles on Water Governance as our conceptual foundation*

The twelve **OECD Principles on Water Governance** are used in this Work Package 2.1 as our main conceptual scheme to define and approach water governance. The OECD Principles were developed by a community of practice of more than 100 water-related stakeholders, comprising actors from the public, private and non-profit sectors from 30 countries, thus encompassing a diversity of historic, cultural, social, economic, political contexts. This community of practice still gathers twice a year through the OECD Water Governance Initiative to discuss, among others, the implementation of the Principles and assessment of water governance status. The OECD

Principles were elaborated and discussed through a bottom-up approach and multi-stakeholder process. Since their approval by the OECD Council in 2015, the OECD Principles and the associated water governance assessment tool were used and applied in a series of Water Policy Dialogues in Mexico, The Netherlands, Brazil, Argentina, Korea, Jordian, Tunisia, African cities, Cape Town. This continued use of the OECD Principles since 2015 fueled a continued refinement of the OECD water governance assessment tool.

The OECD approach to water governance is interested in appraising the state of play of water legal and policy frameworks (what), the institutions in charge (who), the instruments used (how), and the improvements needed to ensure water policies are fit to address current and future water challenges. Among the OECD principles (Figure 6), special attention is given to understanding the clear allocation of **roles and responsibilities** for water policy-making and implementation (Principle 1); the management of water at the appropriate **scales within integrated basin governance** systems (Principle 2); **policy coherence** through effective cross-sectoral coordination (Principle 3); adaptation of **capacity level** of responsible authorities (Principle 4); the production of policy relevant **data and information** (Principle 5); the mobilization and allocation of adequate water **finance** (Principle 6); the implementation and enforcement of sound **regulatory frameworks** (Principle 7); the adoption of **innovative water governance** practices (Principle 8); practices to guarantee **integrity, accountability and transparency** in decision-making (Principle 9); **stakeholder engagement** (Principle 10); the acknowledgment of **trade-offs** across water users, rural and urban areas, and generations (Principle 11); and the promotion of regular **monitoring** and evaluation (Principle 12).

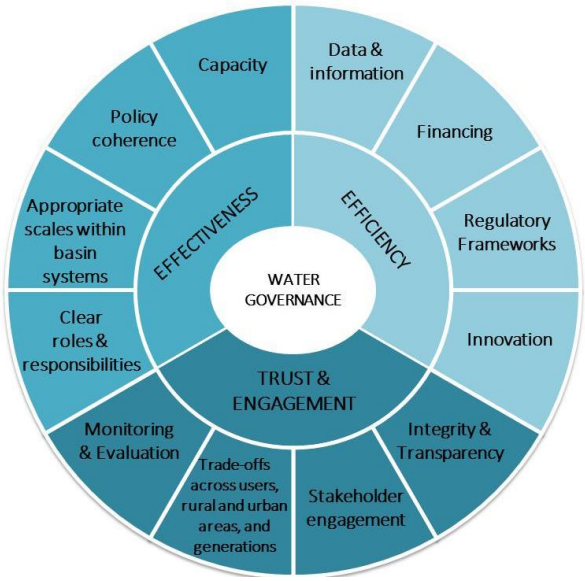


Figure 6: OECD Water Governance Principles. Source: OECD, 2015.

➢ *Accounting for sustainability and resilience in our water governance assessment framework*

The **OECD Water Governance Assessment Tool** which is used as the foundation of the enhanced tool that we propose to create, is complemented and enhanced to account for **sustainability** and **resilience**, with particular attention to the EU environmental and water-related strategies and policy frameworks. This new tool will, therefore, account for the **polluter pays principle** (Art. 9 WFD), the restoration of **freshwater ecosystems** (as per the 2030 Biodiversity Strategy), and the implications of the **EU Green Deal** (see Section 4). Our aim is to produce a tool that encourages sustainable water use across sectors, while insuring transparency and inclusiveness. In addition to empowering citizens and stakeholders to partake in water governance, water management across water-using sectors needs to not only be better integrated and coordinated, but also grow in sustainability and security in terms of access and use. On the one hand, water and sanitation services should be available and sustainable for all. This, for instance, reflects in the development of appropriate tariffs and pricing policies, knowledge systems, as well as gender-sensitive water policies. On the other hand, the water governance framework must respect the needs of the natural aquatic environment, while preventing pollution and protecting biodiversity. This also means adopting decisions that promote resilience in the face of climatic, ecological, socio-economic, or political disruptions.

For this purpose, we carried out a literature review of existing water governance assessment frameworks, and the most recent academic and non-academic studies that relate to water policy and issues of interest to the European Union as regards sustainable and resilient practices.

2.2 Literature review

2.2.1 Existing water governance frameworks

As regards water governance frameworks, we mainly refer to the **OECD Water Governance Framework and Assessment**, based on the principles of **effectiveness** (roles, responsibilities, policy coherence, scales), **efficiency** (data, financing, regulation), and **trust and engagement** (trade-offs, stakeholders, monitoring and evaluation). In relation to this, existing OECD studies on water and water governance (e.g., Water governance in Asia-Pacific, Water Governance in Cape Town, Water Governance in Argentina, Water Charges in Brazil, Water Governance in Cities) have been analysed, together with economic reports by ONEMA regarding the management of water and aquatic environments. To identify potential gaps, we also consulted the more recent **SIWI Water Governance Framework**, as well as a series of questionnaires on water governance, including BEWOP's Water Supply Governance Assessment, CDP 2020 Water Security Questionnaire, the CEO Water Resilience Assessment Framework, and the UN's Users Guide on Assessing Water Governance (Table 1).

SIWI identifies the governance functions (what) as policy and strategy, coordination, planning and preparedness, financing, management arrangements, monitoring, evaluation and learning, regulation, and capacity development, therefore, aligning itself to the OECD principles. In parallel, it distinguishes attributes (how) and stresses the importance of distinguishing between different levels of governance, as well as design effective mechanisms of deliberation, to ensure participation in water governance is as inclusive as possible. While the OECD Water Governance Framework remains our conceptual baseline, SIWI's framework is useful to draw attention on **evidence-based decision-making** around water and **adaptiveness**. In other words, our enhance tool takes inspiration from SIWI in creating a tool that is interested, too, in finding

empirical and contextual evidence for decision-making (e.g., collecting information, learning from inputs, exchanging with technical and scientific experts), as well as identifying adaptive management strategies when faced with imminent changes (e.g., environmental, social) (Jiménez et al., 2020). BEWOP's work, instead, enriches the water governance framework by highlighting the need to map **relations between actors** in water governance, together with **interdependencies between resources**. This is particularly useful when investigating trade-offs between generations or geographical areas. It also insists on identifying the institutions responsible for **environmental protection** in connection to water resources. CDP's framework and questionnaire are used to build our enhanced water governance assessment tool with respect to their interest in **risk assessment procedures** and responses to risks and opportunities. They also distinguish water governance by sector (e.g., agriculture, energy, materials). In line with the concepts of adaptiveness, CEO's framework is applicable to our tool as it focuses on **resilience**, where short-term, gradual and sudden long-term shocks and stresses are understood and addressed. It also mentions **cultural and indigenous knowledge** systems and social connectivity as fundamental components of the water governance system, something our enhanced OECD framework wants to account for. Finally, the UN's Users Guide on Assessing Water Governance illustrates all the principles originally developed in the OECD Framework, also bringing attention to the **'human right to water'**. Our water governance framework is based on the OECD framework, but is also enriched in concepts and questions that deal with environmental issues and adaptiveness, local contexts, and inclusivity.

As recently illustrated by Martín Velasco et al. (2023), the OECD Water Governance Framework presents some difficulties as regards its application as national, provincial and municipal regulations often **overlap**. Thus, it has not always been clear how to assess water governance at **different scales**. It also requires for the assessment to be carried out over a longer period of **time**, as 'the policy framework (what), institutions (who), and instruments (how) can be modified'. However, the OECD Water Governance Principles still provide the highest advantages in assessing water governance: they recognize the **contextual diversity** of each territory in terms of laws, administration, and organizational systems and they aim to support and foster enhanced water management by helping to design better policies and contributing to the governance process (Martín Velasco et al., 2023). The fact that it is a **self-assessment** tool also allows for direct discussions and **dialogues** between the involved actors, monitoring of the progress, and identification of gaps and actions to take, while isolating the specifics at each governance level and for each group of stakeholders. In addition to fostering qualitative improvements and subjective exchanges, the OECD framework, being extremely detailed, allows for **data analysis** and an empirical diagnosis of the issues at stake.

Table 1: Water governance frameworks

Water governance frameworks	
(1) OECD Water Governance Framework (2015)	12 Principles on water governance categorised under 3 overarching themes: effectiveness, equality, trust & engagement

Water governance frameworks	
(2) SIWI Water Governance Framework (2020)	Comprehensive approach to managing water resources effectively, emphasizing principles of transparency, accountability, participation, and social equity to ensure sustainable and inclusive water governance
(3) BEWOP's Water Supply Governance Assessment (N/A)	Evaluates water supply systems based on criteria such as institutional capacity, regulatory frameworks, stakeholder engagement, and service delivery to improve governance and performance
(4) CDP Water Security Questionnaire (2020)	Collects detailed information from organizations about their water management practices, risks, opportunities, and impacts to drive transparency and action on water security.
(5) UN's Users Guide on Assessing Water Governance (2015)	Provides a structured approach for evaluating water governance systems, focusing on institutional frameworks, stakeholder involvement, and policy effectiveness to enhance sustainable water management.

2.2.2 Non-academic literature

Among the non-academic studies, we consulted the following thirty institutional reports and directives in relation to EU environmental and water-related policies and strategies, and complemented by additional grey literature (Table 2).

On the subject of environmental resilience, we consulted the **EU Biodiversity Strategy** for 2030, a comprehensive long-term plan to protect nature and reverse the degradation of ecosystems; the **European Green Deal**, a set of policy initiatives focused on leading the EU to a green transition and reaching climate neutrality by 2050; the **Nature Restoration Law**, which aims to restore ecosystems, species, and habitats in land and sea to guarantee a resilient recovery of nature, as well as mitigate climate change; and the **Circular Economy Strategy**, interested in eliminating pollution and waste, circulating products, regenerating nature. The OECD Urban Studies Report on Circular Economy in Cities and Regions was also consulted.

On the subject of water regulation and environmental quality, we looked at the **Urban Waste Water Treatment Directive**, interested in treating and monitoring concentrations of organic pollution, suspended solids, nitrogen and phosphorus in the discharges of treated urban waste water; the **Drinking Water Directive**, which aims to guarantee access to quality water and protect human health; the **Floods Directive**, which is interested in reducing the risk of flood damage in the EU territory; and the **Water Framework Directive** (WFD), or the main legislation for water protection in the EU since 2000. The latter directive also includes elements regarding public participation (article 14) which represent an important aspect of good water governance that we have accounted for.

As regards the socio-economic aspect of water governance, the **UN Sustainable Development Goals (SDGs)**, aimed at fighting poverty (SDG1), inequality (SDG10), climate change (SDG13), environmental degradation, gender equality (SDG5) and achieving peace and justice (SDG16), have been considered, together with the **UNESCO WWAP Water and Gender Toolkit**, to address gender inequality in the water sector. This is also in line with the **EU Gender Equality Strategy 2020**, interested in providing equal treatment legislation, specific measures in favour of the advancement of women, and an integration of gender policies with all other policies.

To ensure our water governance framework is up-to-date with the **world's current issues**, we have integrated the OECD-based assessment tool with questions directly inspired from non-academic reports and directives. When focusing on resilience, for instance, we analyzed the content of the EU Biodiversity Strategy, the European Green Deal, the Nature Restoration Law, and the Circular Economy Strategy and identified key issues such as how to stop the degradation of **ecosystems**, especially those depending on water; what risk-assessment measures are taken to ensure communities are protected from **climatic variability**; what measures are encouraged to guarantee a green and **sustainable transition**; and how **pollution** is monitored and overcome. In connection with this, the new enhanced tool takes inspiration from all EU directives on water as regards the increasing risk of **floods and droughts**, the rise of pollution in water (for instance, micropollutants), and the measures taken to manage the treatment of **wastewater**. Overall, by integrating these concepts in our new enhanced tool, we aim to encourage water-related institutions to assess their preparedness and knowledge to address water risks through good water governance. Because we are also drawing inspiration from the UN's guide to assessing water governance, we integrate our tool with content on both **social equity** issues identified in the SDGs and **gender discrepancies** described in the UN Water and Gender Toolkit, especially as regards participation in water governance, and the use of and access to sufficient and quality water. In the tool, these concepts are reflected in questions dealing with stakeholder engagement, institutions, and coordination of policies.

Table 2: Non-academic literature review

	Water governance	Environmental resilience & circular economy	Engagement of vulnerable groups
Directives & international frameworks	Urban Waste Water Treatment Directive (1991); Floods Directive (2009); Drinking Water Directive (2021); Water Framework Directive (2000).	EU Biodiversity Strategy 2030 (2020); EU Green Deal (2019); Nature Restoration Law (2022); Circular Economy Strategy (2015); ARUP's City Water Resilience Assessment Methodology (2019).	UN Sustainable Development Goals (2016); UNESCO WWAP Water and Gender Toolkit (2019); EU Gender Equality Strategy (2020).

	Water governance	Environmental resilience & circular economy	Engagement of vulnerable groups
Institutional studies	OECD Studies on Water Governance in Asia, Brazil, South-Africa, Argentina (2017, 2019, 2021); ONEMA's Economic Analysis for Management of Water and Aquatic Environments (2013).	OECD Urban Studies Report on Circular Economy in Cities & Regions (2020); Aqua Publica Europea report (2019).	OECD Report on the Governance of Regulators (2017) & OECD Stakeholder Engagement for Inclusive Water Governance (2015, 2018, 2022); Danube Water Program (2019); World Bank's Women in Water Utilities: Breaking Barriers (2019).
Number of directives & institutional reports consulted	10	7	9

2.2.3 Academic literature

A review of the relevant academic literature is provided below, where twenty-three research articles have been analysed to identify key problematics, or themes, on sustainability and resilience unaccounted for in existing assessment tools for water governance.

While the OECD principles are not modified in the new enhanced tool, each of them is enhanced and broadened taking into account four new themes. The most recent directives and policy reports insist on the urgency to transition to a **circular economy** (e.g., EU Green Deal, Urban Waste Water Treatment Directive); the increasing role of **local empowerment** (e.g., OECD Urban Studies Report on Circular Economy in Cities and Regions); **engagement of vulnerable groups** (e.g., UN Sustainable Development Goals, UNESCO WWAP Water and Gender Toolkit, Drinking Water Directive); and **environmental resilience** (e.g., Nature Restoration Law, Floods Directive, EU Biodiversity Strategy for 2030, ONEMA's Economic Analysis for Management of Water and Aquatic Environments). An analysis of recent academic literature confirms the driving role of circular economy, climate change, local empowerment, and inclusivity in shaping a type of water governance capable of tackling sustainability and resilience problems (Table 3). The common denominator to these four dimensions is the ability of water governance to **adapt to new challenges and uncertainties**, whether associated with the environment, vulnerable segments of the population, or local needs.

➢ *Circular economy*

First, new attention has been brought by scholars worldwide to the role of **circular economy in water governance** so as to minimise pollution and over-abstraction/consumption of water, as well as the environmental effects linked to water activities. As specified by Morseletto et al. (2022), 'water is a unique element in the circular economy because it is a resource, a product and a service with no equivalent in the economic system'. When thought of as part of the circular economy's reduce-reuse-recycle strategy, it serves as a perfect basis for **sustainable water management**.

Reuse factors in water governance (*e.g.*, recycling treated wastewater for agricultural irrigation, industrial processes, groundwater replenishing) would allow to create the paradigm shift sought by the EU (see the 2015 Circular Economy Package), guaranteeing an **enhanced resource recovery** and a sustainable economy free of waste and emissions (Sgroi et al., 2018). Despite water being essential to human life, the planet, and the economy, this renewable resource has undergone significant **pressure** in the last decades, leading to insufficient sanitation, resource depletion, water over abstraction and extinction of species in the European territory. To address this, Smol et al. (2020) recently proposed policy makers to focus on **reducing** the use of water, **removing** pollutants from water, **reusing** treated wastewater, **recovering** nutrients and energy from wastewater, and **rethinking** its use in a sustainable and circular way. This is shown in the figure below on WICER 'Water in Circular Economy and Resilience', produced by the World Bank (Figure 7). Investigating the extent to which policy makers are committed to and knowledgeable on a circular water use is crucial for water governance to overcome the deterioration and depletion of resources, while monitoring water quality and associated risks (Voulvoulis, 2018).

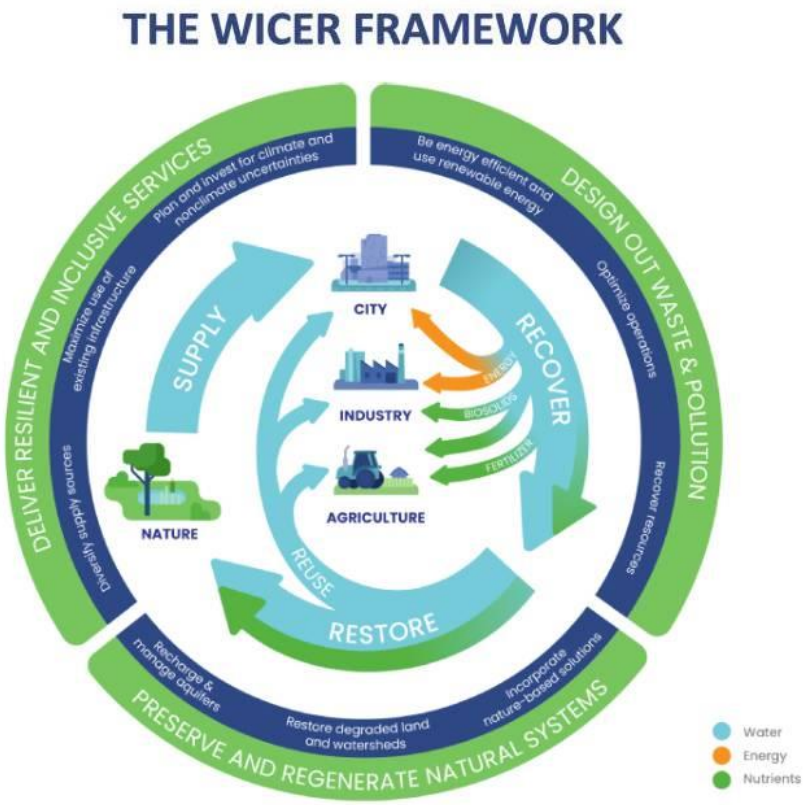


Figure 7: Water in circular economy and resilience. Source: World Bank, 2021.

➢ *Integrated strategies and local empowerment*

As illustrated by Savini and Giezen (2020), 'contemporary environmental governance is increasingly relying on and targeting households for responsibilization, with individuals being seen as proactive actors in eco-consumption, self-production, and utility management practices'. As a result, **local stakeholders** have become the centre of attention as regards their ability to **promote and enable sustainable uses of resources**, including water (Figure 8). Because they have the power to increase water conservation, while creating more resilient water infrastructures, '**decentralized water systems** are often regarded as more sustainable' (Sgroi et al., 2018). As explained by Petit-Boix and Leipold (2018), the short- and long-term feasibility and effects of a set of strategies is best measured when we account for the population size, the geographical location, as well as the administrative structures available. By 2050, 68% of the population will live in urban areas. In the world, an increase of 1.55% has been observed from 2021 to 2022, when the **population living in cities** equalled 4,523,091,429. In Europe alone, the rate of urban population was 75.45% in 2022, registering an increase of 0.5% from the previous year. This suggests that, in addition to countries, further attention should be granted to **decentralized bodies** (*e.g.*, **regions, watersheds, cities, etc.**) on whether they are able to support good water governance by using their own assets, efficiently managing utilities and waste companies, enforcing regulations, as well as collaborating with other local, national, international stakeholders (Christensen, 2021; Lakatos et al., 2021).

Figure 4.3. **Scales of water governance in cities**

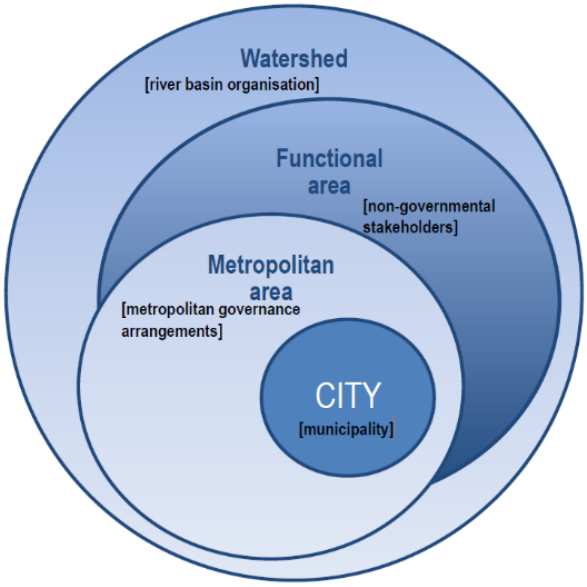


Figure 8: Water governance in cities. Source: OECD, 2016.

When it comes to **rural and urban** communities, for instance, regions can represent the adequate scale for guaranteeing solidarity and solving **trade-offs** that local governments cannot manage. Rural-urban **partnerships** (OECD, 2013) are able to facilitate access to jobs (also through capacity building), amenities, and services (health, transport, education), as well as enhance the

production of public goods (infrastructures), and the preservation of natural assets (land-use management, biodiversity, water resources). **Cooperation** can be easier where the gap in size and economic conditions between rural and urban areas is not so significant, transaction costs are low, and sharing of information efficient, complete, and regular.

Urban areas usually possess the financial resources, while rural areas are rich in natural resources (Gebre & Gebremedhin, 2019). To achieve a positive-sum game for all, strategies such as public debates on the risks and costs of bad water governance, financial responsibility, affordability, and sustainability need to be implemented so that **different and complementary assets can be integrated**. On this subject, priority should be given to overcoming the **geographic mismatch between different scales**: while national strategies and policies may be ambitious in the objectives they aim to achieve, the management of resources, including water, at the local level can be costly and complicated especially when trade-offs between rural and urban areas are high. A series of gaps need to be considered for a successful integration (Akhmouch, 2012): **administrative gap** —instruments to reach effective size and adequate scale; **information gap** — instruments to reveal and share information; **policy gap** —instruments to create multidimensional approaches; **capacity gap** —instruments to build local capacity; **funding gap** — shared financial mechanisms; **objective gap** – instruments to align multilevel objectives; **accountability gap** —instruments for institutional quality, integrity framework at the local level, citizen involvement.

➢ *Improved engagement of vulnerable groups*

When thinking of **stakeholders' engagement**, another fundamental aspect is how vulnerable categories are accounted for in water governance. A recent meta-analysis by Newig et al. (2023) concludes that, in general, participation positively affects environmental governance outcomes, including those related to water (e.g., drinking water, polluted water, degradation of ecosystems, floods). However, while stakeholders' difficulties and disadvantages are considered in theory, Akhmouch and Clavreul (2016) mentioned 'a lack of evidence-based assessment on how engagement processes contribute to water governance objectives' from a social equity perspective. The Sustainable Development Goals, for instance, include a series of targets for **inclusiveness** and **gender equality** in water access, use, and management. While the existing assessment tools have investigated countries' general attitude towards stakeholders' engagement, we think the issue of **marginalization** should be explicitly analysed. In countries like Kenya, 'achieving strategic gender goals remains a challenge' due to inadequate gender mainstreaming policies and socio-cultural beliefs that are unable to support 'a more **gender-equitable access to water**' (Ifejika Speranza and Bikketi, 2018). A recent study by Nguyen et al. (2019) for Vietnam explains how water insecurity causes women to shoulder heavier caring obligations due to poor water conditions, loss of fisheries, and shrinking income. This affects marginalized categories in general. In Europe, there are still **2 million people** without suitable water or sanitation, including the **Roma community**. Women and girls of color, low-income women experience water insecurity also in **San Marino, Cyprus, Belgium, Andorra, Greece, and Spain**, still considered high water-stressed countries (Hofste et al., 2019).

In parallel, while their presence in committees is sometimes guaranteed by **gender quotas**, women from vulnerable communities 'often do not voice their opinions' and, more in general, are considered not as technical, rational, scientific, or expert in their water professions as their male counterparts. According to a report by the Danube Water Program (2019), women

staff in European water authorities is only 10, 19, 26, and 29% in, respectively, Ukraine, Serbia, Bosnia and Herzegovina, and Moldova. Similarly, flexible working only affects 19% of the female staff in Pristina's regional water company, while in Brasov's water company, opportunities for leadership development and training is for 30% of women. In general, men in these institutions are also more likely to be promoted compared to women. 'Gender-based occupational segregation is part of the equation of the underrepresentation of women in water utilities', which explains why, 'in the field, almost everyone is a male' (World Bank, 2019).

Guaranteeing representation and inclusiveness in water governance is fundamental for another reason. At the private level, gender diversity in committees is shown to be positively associated with companies' **environmental performance** and commitment to sustainable development (García Martín & Herrero, 2020). Investigating issues of representation and gender equality in water governance in Europe can only lead to **positive spillovers** for countries where gender policies are not yet fully developed. On this subject, in addition to quantity (e.g., number) and quality (e.g., roles, education) of **female participation** in water governance, we are also interested in the extent to which gender and water policies intertwine so as to make sure that gender inequality is not reinforced by water governance at various scales (Nguyen et al., 2019). This is something highlighted by Hamdy et al. (2004) also for the countries of the **Mediterranean** (e.g., Italy, Spain, Malta), where gender issues have been 'confined as women development and kept **compartmentalized as a marginal programme within the water sector**'. On this subject, the fact that gender inequality affects countries all over the world justifies our argument that the OECD-based enhanced water governance assessment tool for the EU can be also used outside of the EU.

➢ *Environmental resilience*

The fourth new theme that needs to be incorporated in the assessment of water governance is **environmental resilience**. The 2020 EU Green Deal, in particular, calls for **climate neutrality** and a **green transition** that preserves **biodiversity**, while monitoring and preventing **floods** and other natural disasters. As stressed by Valdés-Pineda et al. (2014), hydrological uncertainty is likely to increase due to the influence of climate change, encouraging policy makers to invest in the capacity of sustainable water resources management. The **degradation of water bodies** and misunderstanding of the local impacts of climate change are among the concerns. The authors also insist on the importance of promoting a **water-conservation-oriented culture**. On the one hand, it seems crucial to investigate how policy makers at the national, regional, local level address the issues of changes in water regimes, geomorphic hazards, heavy precipitations regimes, the melting of frozen grounds (Beniston et al., 2011), and other extreme weather events such as floods, on which the EU recently produced a directive. On the other hand, it appears equally fundamental to act following a water governance that accounts for and protects the environment. In the words of Woodhouse and Muller (2017), 'water is a fugitive, unequally distributed, highly variable yet renewable natural resource which is inherently part of the natural environment but whose use is essential to all social and economic activity'. In accordance with the EU Nature Resilience Law, scholars agree on the emergence of threats posed to the animal and plant world by our population's exploitation of the environment and its resources, including water. In this regard, we are interested in understanding what decisions are taken to increase the **quality of water** and remove **pollutants** that could harm aquatic species —for instance, to safeguard **marine protected areas** (Nunes et al., 2022); avoid systematic grey infrastructures in favour of **blue-green infrastructures** (Hamel & Tan, 2022) and promote smart green

technologies; protect the **landscapes** —for instance, restore **drained peatlands and wetlands** (Vasander et al., 2003)— and their animal and human communities from dangers caused by bad water management. While the core OECD dimensions (effectiveness, efficiency, trust and engagement) will be accounted for in the enhanced water governance assessment tool, these will be integrated with **adaptiveness** directly derived from environmental resilience; namely, ecosystem protection and conservation, disaster response and recovery, capacity development of institutions and communities, and infrastructure and asset management. Building environmental resilience encompasses the protection of the ecological functions to supply, purify, and protect the water sources on which services, health and well of communities depend. In addition, building environmental resilience through conservation and protection of ecosystems contributes to addressing the climate risks such as through mitigating the effects of water-related hazards of floods and droughts by regulating water flows (Figure 9).

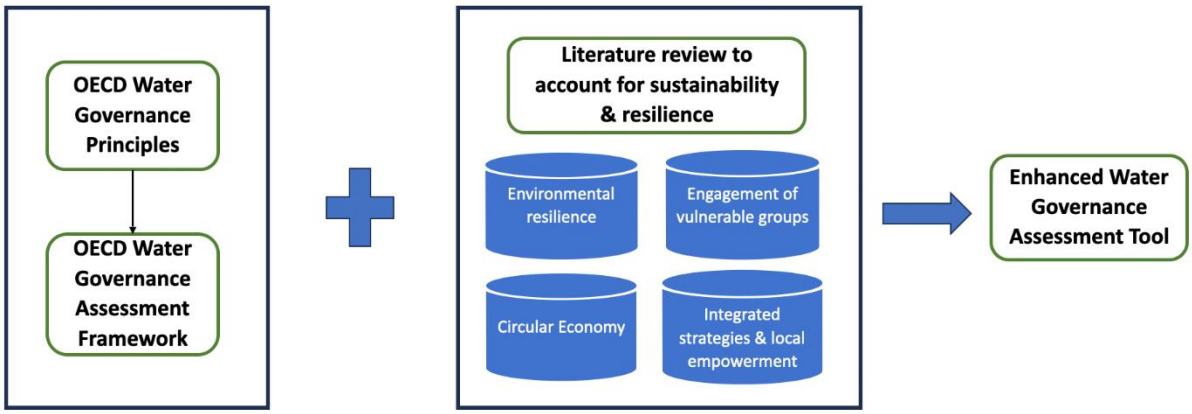


Figure 9: InnWater Water Governance Assessment Structure

Table 3: Academic literature on water governance and water-related topics

	Circular economy	Integrated systems & local empowerment	Engagement of vulnerable groups	Climatic environmental resilience
Academic articles	Morsetto et al. (2022); Sgroi et al. (2018); Smol et al. (2018); Voulvoulis et al. (2018).	Savini & Giezen (2020); Sgroi et al. (2018); Petit-Boix & Leipold (2018); Lakatos et al. (2021); Christensen (2021).	Akhmouch & Clavreul (2016); Ifeijka Speranza & Bikketi (2018); Nguyen et al. (2019); Hamdy et al. (2004); Hoftse et al. (2019).	García Martín & Herrero (2020); Valdés-Pineda et al. (2014); Beniston et al. (2011); Woodhouse & Muller (2017); Nunes et al. (2022); Vasander et al. (2003); Hamel & Tan (2022); Dottori et al. (2023); van der Wiel et al. (2023).
Number of articles consulted	4	5	5	9

The new enhanced water governance assessment tool is a questionnaire that comprises five sections: ***i)* Mega Trends & Resilience; *ii)* Policy, Institutions & Regulation; *iii)* Financing; *iv)* Data, Monitoring & Evaluation; *v)* Stakeholder Engagement.** Each section includes pre-existing questions and newly developed questions encompassing the four dimensions developed in sub-section 2.2 c. The questionnaire uses questions directly taken from the **OECD Water Governance Framework Indicator**, where a set of questions and hypotheses is presented for each of the **twelve water governance principles**. Questions are, therefore, interested in **roles and responsibilities** in water governance; the management of water at the appropriate **scales within integrated basin governance** systems; **policy coherence**; **capacity development** of authorities; **data and information**; water **finance**; **regulations**; **innovative water governance** practices; **accountability and transparency** in decision-making; **stakeholder engagement**; **trade-offs** across water users, rural and urban areas, and generations; **monitoring** and evaluation. While the twelve OECD principles are kept as a basis in the new water governance assessment tool, the tool itself is integrated with questions taken or developed from OECD questionnaires related to the circular economy, the role of decentralizing bodies in governance in general, and UN questionnaires related to gender differences in water access, use, and governance. New questions are formulated with respect to the megatrends highlighted in Section 1 and confirmed by the issuance of international directives related to water. On this subject, new questions were built by analysing the non-academic and academic literature as regards **environmental resilience**, **circular economy**, **local empowerment**, and **the engagement of vulnerable groups**. The integration between pre-existing questions typical of the original OECD Water Governance

Framework and new questions arising from the literature give origin to our new enhanced water governance assessment tool.

In the new enhanced questionnaire, questions are not grouped according to the 12 principles, but to the five categories created and mentioned above. This is justified by the willingness to create an assessment tool that, although inspired by the OECD principles, does not adhere to the OECD tool's structure, maintaining **autonomy in the nature and contents of our assessment**. In particular, through our structure, we are able to highlight the concerns typical of today's economies and societies, also drawing on our **Pilot Sites' needs**. The Mega Trends & Resilience block accounts for the threats posed to water security by water risks, the objectives of the EU in terms of **sustainability and resilience**, as well as the sites' problems of **water scarcity and water quality**. Financing allows us to consider the possibilities of investment in water management and **water allocation** that is efficient and equal, while Data & Monitoring ensures objectivity and constant evaluation of water governance practices. The blocks on Institutions and Policy & Regulation verifies Pilot Sites' compliance to the EU guidelines, as well as accounts for local expectations, including economic divergences, **ecosystem services**, and drinking water aspects. In relationship to this, our enhanced tool aims to shed a light on the importance of maintaining water governance **inclusive**, hence the focus on Stakeholder Engagement.

By considering multi-level and cross-sector water governance dimensions, as well as issues of social innovation, the original OECD assessment tool has been adapted to the objectives of **InnWater**. The **enhanced water governance assessment tool** provided below aims to account for issues that have been discussed and highlighted by the EU in the most recent directives, international reports, and laws. Namely, the implications of **climate change** and, thus, the safeguard of the environment and its species; the emergence of a **circular economy** where we reduce, reuse, recycle; and the urgency of bridging gaps between privileged users and **vulnerable categories**, including women. This is justified by the growing interest of the EU in greener solutions (see the EU Green Deal), protected biodiversity (as required by the 2030 Biodiversity Strategy), and the broader perspective on a fair and just transition in the name of inclusivity. Compared to other continents, the EU is leading the way for a **sustainable transformation of the economy and society**, including how we use and manage water. When adapted to specific international contexts, the tool can be used to assess water governance anywhere in the world. First, because it stems from the OECD Water Governance Principles, intentionally designed and reviewed by a large variety of stakeholders from across the world (gathered in the OECD Water Governance Initiative); and intentionally designed to be applicable at the international level. Second, because the emerging themes identified in the recent EU directives and confirmed by academic literature regard the entirety of the planet.

3. WATER GOVERNANCE ASSESSMENT PROCESS

Our water governance assessment tool will be applied to several pilot sites in the EU territory to *i)* produce a **diagnosis of water governance at different scales and in different contexts**, *ii)* identify water governance gaps and areas for potential remedial actions, *iii)* identify **discrepancies and similarities across European areas** with different quantity and quality of water

and water management, and *iv)* highlight **good water governance practices** that align with the objectives outlined in the most recent EU directives, including climatic environmental resilience, circular practices, social equity and a fair transition to a sustainable future. The tool per se aims to investigate what are the current characteristics of water governance arrangements implemented, which institutions are responsible, what instruments are used to achieve objectives, what coordination and engagement mechanisms are in place, and what obstacles are still present. The tool is designed to be used at different **geographical scales** (national, basin, district, region, municipal) and **governance levels** (national, regional, local) and **across sectors** (water, agriculture, industry, energy)[1] —in its digital version, the questionnaire will have a **filter option**, with questions 'activated'/screened depending on whether the questionnaire will be filled out by **policy makers, coordination bodies** (e.g., river basin organizations[2]), **third parties** (e.g., civil organizations), etc. We aim to produce an assessment that is **independent**, **transparent, forward-looking** in terms of future recommendations, and **non-discriminatory**. For more details on the pilot sites' implementation guide, we refer to **D5.1.** of the InnWater project. While the assessment tool is meant to be applied in **EU territories**, countries **worldwide** are welcome to use it for achieving an effective, efficient, inclusive, and resilient water governance.

3.1 Key roles to conduct the water governance assessment process

Our assessment identifies three key roles as those engaged in conducting the water governance assessment process: namely, lead institutions, facilitators, and stakeholders.

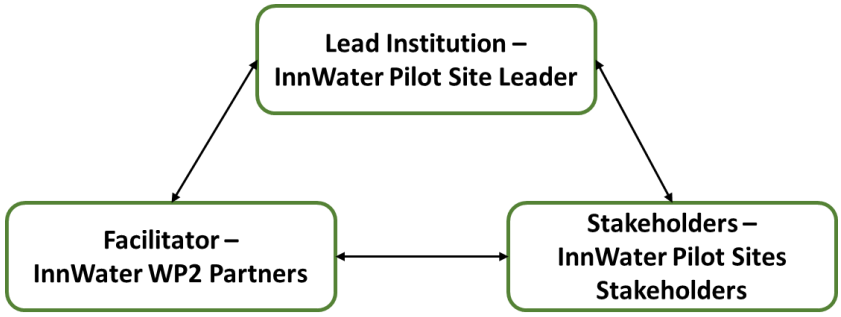


Figure 10: Key roles in water governance assessment

Lead institutions are the institutions responsible for the tasks regarding the **evaluation process**. They define the scope, objectives and rules, identify all relevant stakeholders, design the workshop convening stakeholders, conduct the consultation process, and carry out any other follow-up tasks. Normally, these are institutions or government authorities with water resources or water services management responsibilities. They are also required to have experience in monitoring and assessing water strategies and policies, as well as knowledgeable in the range of

[1] Also in reference to the Water Energy Food Ecosystem nexus.
[2] Article 14 of the Water Framework Directive states that all 'Member States shall encourage the active involvement of all interested parties in the implementation of this Directive, in particular in the production, review and updating of the river basin management plans'.

methodologies used to collect inputs in a transparent way. Lead institutions are also responsible for accounting for the human and financial resources necessary to carry out the assessment as well as the workshops. For InnWater project, the lead institution role will be fulfilled by the Pilot Site Leaders. They will engage with InnWater Steering Committee, composed of the WP leaders, and they will lead the water governance assessment on their sites, supported by a facilitator.

A **facilitator** can be an independent and trusted institution or person, who will aid the leading institutions throughout the evaluation exercise and guarantee the **neutrality** of the process and its inclusiveness, ensuring that all stakeholders are heard, including those less empowered to express their opinions. The facilitator should always be impartial, legitimate, and credible to the stakeholders. Experience in water issues and stakeholder consultations is required, as well as an understanding of policy making and its implications. For this reason, a facilitator should prevent the assessment from becoming a self-satisfaction exercise. For InnWater project, the facilitator role will be fulfilled by the Work Package 2 partners. They will support Pilot Sites Leaders in conducting the water governance assessment, convening the workshops, and facilitating the discussions among stakeholders.

As regards the **stakeholders**, these are people, a group, or organisation interested in a water policy or other topics directly or indirectly affected by water policy or/and with the ability to influence the outcome positively or negatively. Among the potential stakeholders, there could be **users** of water (domestic, industry, irrigators, others), **policy and strategy actors** (supranational bodies, national, regional, local government, watershed institutions, regulators), **operators** (service providers), **interest and influential groups** (civil society [3], consumers' associations, trade unions, science, research centers, and think tanks, media, construction and housing associations, nature and environmental NGOs), financial actors (donors, financial institutions), **underrepresented actors** (women, youth, subsistence farmers, poor, non-water civil society organizations working on governance issues, indigenous communities, urban slum dwellers, nature). In order to ensure all relevant stakeholders are identified, a **stakeholder mapping** will be jointly conducted by the lead institution and the facilitator as a first step of the water governance assessment process. This will help understand stakeholders' interests and motivations, the extent to which stakeholders will influence or be affected by water policy, whether there are incentives for those whose voices are usually less heard (e.g., women, youth, low-income populations). Lead institutions and facilitators are also asked to provide stakeholders with the necessary and sufficient support to understand the water governance principles and the assessment per se.

3.2 Engagement process

To guarantee an effective and inclusive engagement process in the assessment of water governance, three steps are followed: namely, preparation, assessment, and water governance gap identification (Figure 11). A Reference Guide on the transition from assessment to actions is provided in D2.2.

[3] For more details on citizen engagement, we refer to **D3.1.** of the InnWater project.

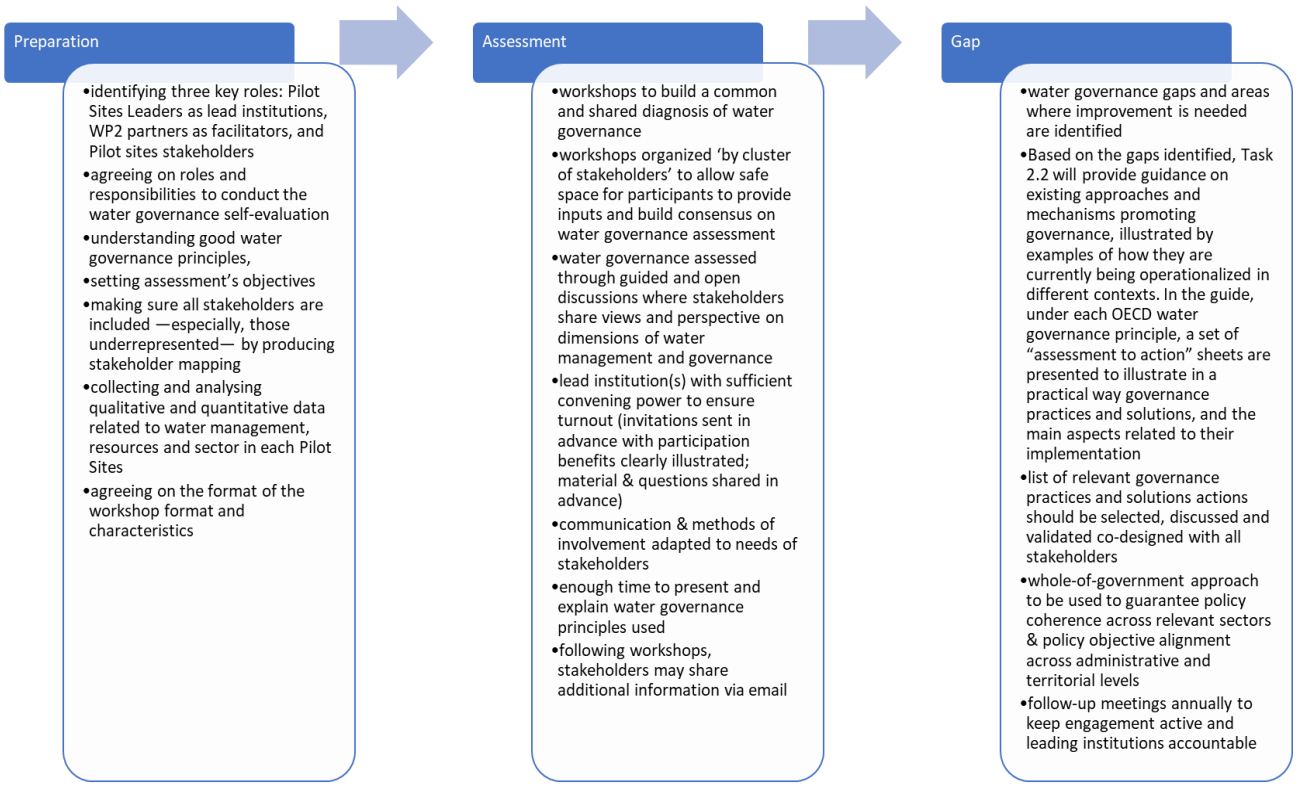


Figure 11: Water governance preparation, assessment, recommendation phases

3.2.1 Preparation phase

As introduced above, the preparation phase includes:

- **identifying the three key roles** that will be part of the assessment (i.e. Pilot Sites Leaders as lead institutions, WP2 partners as facilitators, and Pilot sites stakeholders),
- clearly and jointly agreeing on their exact roles and the exact scope of their responsibilities in the water governance self-evaluation process,
- understanding the **principles** of good water governance,
- setting the assessment's **objectives**,
- making sure that all **stakeholders** are included —especially, those underrepresented— by producing a stakeholder mapping,
- collecting and analysing qualitative and quantitative data related to water management, resources and sector in each Pilot Sites,
- discussing and agreeing on the format of the workshops (format based on local needs, experience, capacity and context; rules for engagement; engagement expectations; number, structure, methodology, and objectives of the workshops, etc.) to be organised as part of the assessment phase.

As regards the collection and analysis of **qualitative and quantitative data**, support will be provided by WP2 partners based on Pilot Sites Leaders' expertise and knowledge on water governance, water risks, institutional trends, environmental challenges, social and gender issues. Organizers can also invite stakeholders to pre-fill specific tables before the discussion takes place. When interacting with stakeholders in the preparation phase, **ethical sensitive language** should be used to build trust and overcome resistance. The qualitative and quantitative data collected before the assessment phase will be gathered in ***ad hoc* reports** summarizing responses to questionnaires (e.g., through tables, short open-ended questions, etc). The collection of data will be carried out according to faithfulness to **major ethical principles**; including, the European Code of Conduct for Research Integrity and the Charter of Fundamental Rights of the EU and the European Convention on Human Rights. This means that the principles of research integrity, truth-telling, non-stigmatization, accountability, and coherence will be followed. Where personal data will be collected, informed consent will be required and data will be safely anonymized. If artificial intelligence is to be used in certain activities, the necessary ethics guidelines will be provided. Ethical considerations will be also considered as regards storage place and duration, privacy safeguard, and access to data. The selection of participants (e.g., stakeholders) will go beyond **gender balance** and also look at **inclusiveness** and **representativeness** more in general.

Data analysis as well as preparation tasks should be performed jointly by Pilot Sites Leaders and WP2 partners, using remote meetings for coordination purposes.

3.2.2 Assessment phase

3.2.2.1 Actors involved

During the assessment phase, **workshops** will be organized with InnWater Pilot Sites Leaders (lead institutions), the WP2 partners (facilitators) and stakeholders (public/private/non-profit and from different backgrounds) to build a common and shared diagnosis on water governance. The workshops can be organized 'by cluster of stakeholders' (i.e., information for all questions is gathered from different sets of stakeholders, while the lead team carries out the analysis based on that information) with the purpose of allowing safe space for participants to provide inputs and build **consensus** on the water governance assessment. Respondents are 'clustered', or divided into groups, according to a specific category. For instance, respondents of national, regional, local governments can form the **cluster** of governments. Economic regulators and environmental regulators can form the cluster of regulators. Financial institutions and donor agencies can form the cluster of financial actors. Social movements, community-based organizations, member-based organizations, and non-governmental organizations can form the cluster of civil society. In particular, some clusters may be grouped where and when possible, to ensure **multi-level and cross sectoral engagement** so as to overcome the fragmentation typical of the silo approach and **connect actors** who are normally isolated.

3.2.2.2 Workshops organization

To guarantee a high rate of participation, workshops can be organized in person, virtually, or broadcast live for those unable to participate, so as to allow a wide participation of **stakeholders** (public, private, civil, industry, science, media), in groups or in plenary sessions. During this phase,

the state and quality of water governance is assessed through guided and open discussions where stakeholders share their views and perspective on the various dimensions of water management and governance. In particular, the questions of the 'Assessment Phase' part of the questionnaire are used as guidelines to build, facilitate, and lead the discussion. The lead institution(s) should ensure that they have sufficient convening power to ensure turnout to the workshops. For this purpose, invitations should be sent out to stakeholders in advance, with the benefits of participating in the workshops clearly illustrated. Material should also be shared before the workshop, as well as themes that will be discussed during the workshop. **Communication** should be adapted to the needs of the participating stakeholders, as well as the methods of their involvement. During the workshop, enough time should be allowed to present and explain the water governance principles used. Following the workshops, stakeholders may share additional information or complementary **responses** via email. Any misinterpretation should be clarified, as well as drastic diverging opinions based on the different levels of knowledge and expertise of stakeholders.

3.2.2.3 Participation mechanisms

A clever way to guarantee persistent **engagement** is to provide participants with options regarding the assessment by, for instance, letting them choose between the following actions: **audit** (i.e., check to what extent the governance system aligns with the OECD principles); **evaluate** (i.e., investigate the quality of a governance system); **learn and reflect** (i.e., discuss what measures are needed to strengthen the water governance system); **benchmark** (i.e., compare water governance system operation and performance against other water governance systems). Alternatively, a **co-creation methodology** can be used: Pilot Site Leaders can, for instance, exploit the interactive nature of posters by allowing participants to mark their individual reflections on the performance of each category based on their perceived levels of implementation. Colour rankings or scores can be used to reflect the **level of consensus** in the room.

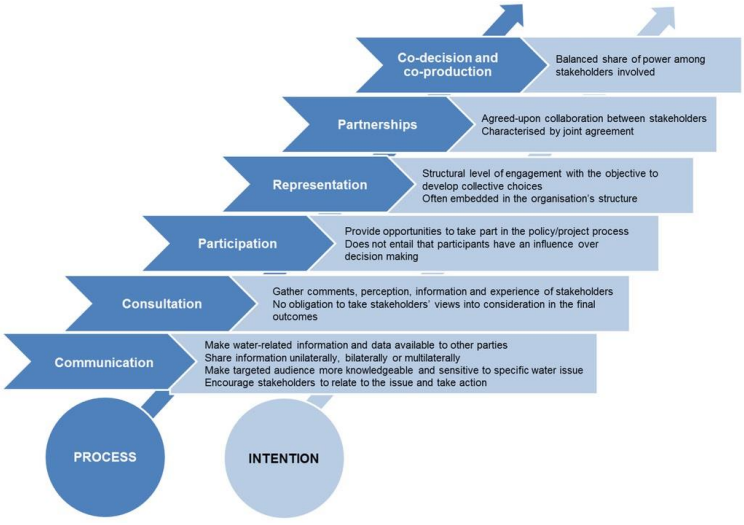


Figure 12: Stakeholder engagement for effective water governance (OECD, 2015)

➢ *Governance gap identification phase*

As regards the **presentation of the results**, international institutions such as the OECD, the UN, the EU have recurred to lines, bars, columns, pie and donut charts, bar charts, stacked bar charts, histograms, funnel and pyramid charts, as well as the more detailed gauges or traffic lights charts, scatter plots, comparison charts, bubble charts, and spider or radar graphs. While the most common charts and plots are efficient in summarizing quantitative data, successful alternative methods are used to provide overviews of qualitative investigations. The **traffic light approach**, for instance, is able to indicate whether the governance dimension is in place and functioning, whether it is in place but the level of implementation is not complete, whether it is in place but it has not yet been implemented, whether the governance dimension is under development, whether it is not in place, and whether data are not available (Figure 13). The **five-scale assessment** is reflected in five colors (from green to red, plus the gray non-applicable option) and visualized through the 'highly prescriptive' (Grafton et al., 2019) use of a wheel containing the color of evaluation (OECD, 2018; Romano & Akhmouch, 2019; Daoud et al., 2022; Schneider et al., 2015). In the case of water governance, water drops indicate whether stakeholders agree on the assessment made (three: strong consensus; two: acceptable; one weak consensus). **Spider graphs** are also often used for showcasing water governance assessment results, as they display multivariate data across three or more dimensions (e.g., water governance principles). McDonald (2016), Delgrado-Serrano et al. (2017), and Nhamo et al. (2020) recently used it to represent, respectively, the performance of various public water services, sustainable community-based water governance, and the water-energy-food nexus.

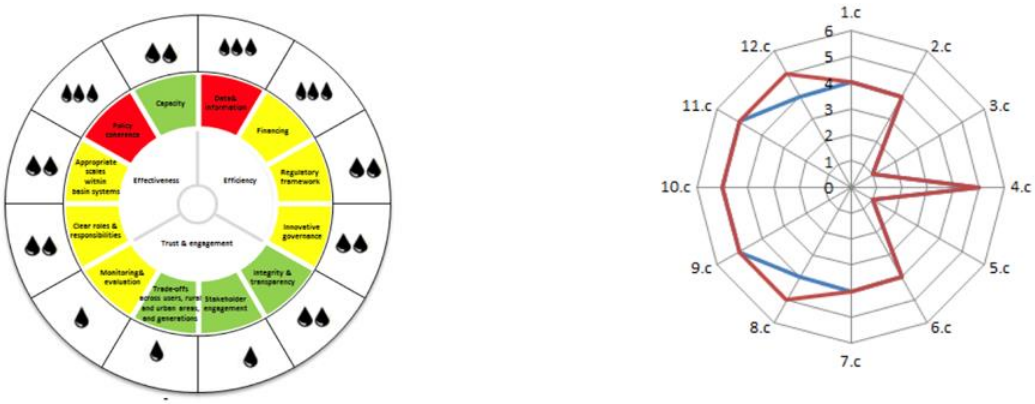


Figure 13: Traffic light and spider graphs for water governance assessment. Source: OECD, 2015.

Table 1-1. Water governance characteristics in Asia – Pacific countries

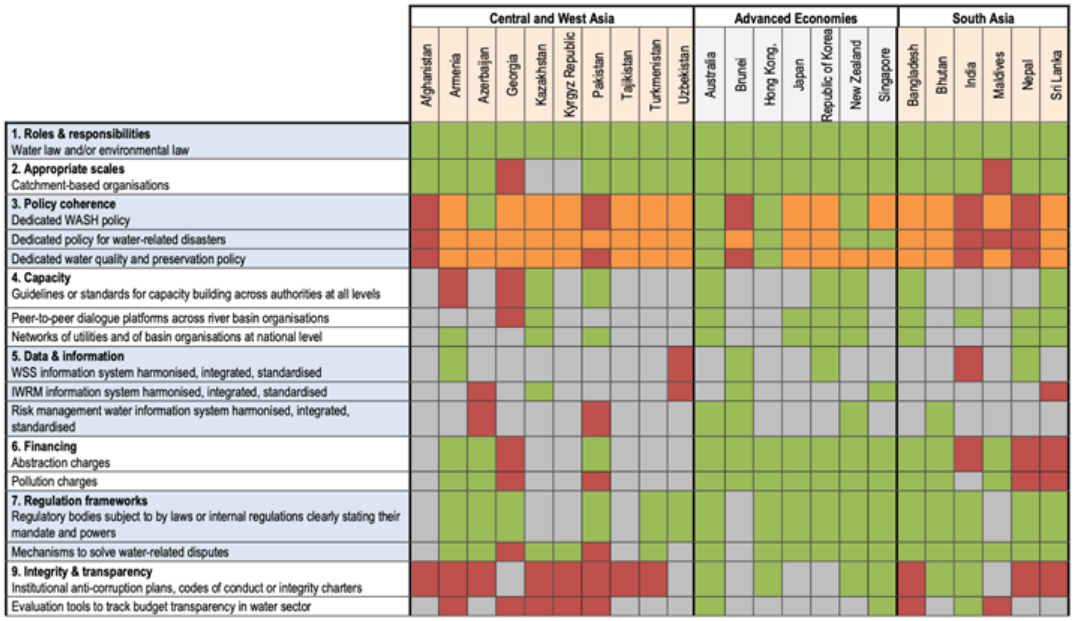


Figure 14: Color coding for water governance assessment. Source: OECD, 2021.

One additional effective way to represent water government assessment outcomes is through **color coding** (Figure 14). OECD (2021) recently developed a four-scale color coding to assess the level of implementation of each principle on water governance, with green being 'in place, functioning', orange being 'in place, partly implemented', red being 'not in place', and grey being 'no data available'. This method allows to summarize results in a very complete, straightforward, and clear way, shedding light on at-risk situations as well as best practice cases. A series of institutions responsible for water regulation made use of this representation, including the Flanders Environment Agency[4]. As regards our analysis, we plan to present results using a combination of different graphs: qualitative data will be presented using color coding, due to the benefits explained above, while quantitative data will be presented using spider graphs or histograms.

In this third phase, and as a result of the assessment phase, **water governance gaps** and areas where improvement is needed are identified. Based on the gaps identified, Task 2.2 will provide, in a "Reference Guide for Programming", guidance on existing approaches and mechanisms promoting governance, illustrated by examples of how they are currently being operationalized in different contexts. The content of the Guide is the result of desk research, covering "common barriers" found in Europe to promote governance of water systems and identifying "emerging innovations" to overcome barriers. In the guide, under each OECD water governance principle, a set of "assessment to action" sheets are presented to illustrate in a practical way governance practices and solutions, and the main aspects related to their implementation. The list of relevant governance practices and solutions should be selected, discussed and validated with all

[4] https://www.vmm.be/water/waterbesparing/waterverbruik-totaal.

stakeholders. A **whole-of-government approach** should be used to guarantee policy coherence across relevant sectors and their priorities, as well as align policy objectives across administrative and territorial lines. The relevant governance practices and solutions should include realistic and achievable objectives (e.g., they should be **SMART** — specific, measurable, achievable, relevant, time-bound). In order to guarantee feasibility, they should be adapted to reasonably expected resources and avoid having to deal with a lack of financial need or insufficient qualified personnel. **Follow-up meetings** can be organized annually to keep the **engagement** of stakeholders active and leading institutions **accountable**. Progress on the defined objectives and stakeholders 'inputs should also be tracked through a set of **transparent rules to monitor** the various processes. While a baseline assessment of water governance will be provided, the assessment is to be considered dynamic as it should be **repeated over time** to measure progress. The dynamic nature of the self-evaluation process allows for an increase in the quality of the assessment every time the assessment is carried out, as well as a continuity in the scope, objectives, and design of the evaluation process. The resulting assessment material can be **shared ahead** of the second, third, and following meetings to allow for a smooth design of the action plan.

4. ENHANCED WATER GOVERNANCE ASSESSMENT TOOL

The questionnaire is organized as follows: in the preparation phase (Questions 1-19), the questions asked aim to collect essential water governance information prior to the assessment and discussion phases of the workshop. These questions are normally filled out by Pilot Sites Leaders. In the assessment phase, we distinguish questions according to five macro-areas (Questions 20-77). These include: mega-trends and resilience; policy, institutions and regulation; financing; data, monitoring, and evaluation; engagement and accountability. The text **in black** is inspired by the original water governance questionnaires from OECD, while additions with respect to the new themes identified in our analysis are written **in green**. The questions of the assessment phase are filled out by Leading Institutions - Pilot Sites Stakeholders, with the assistance of Facilitators and InnWater partners.

4.1 Preparation phase

Question 1 Please fill in the two tables below, for water resources management and for water services provision. Indicate the institutions that are currently in charge of designing and implementing water policies at the national or subnational level. Add any additional column / information you deem necessary.

Table 4: Roles and responsibilities for water resources management

Name of the institution	**Nature of its role** (policy making, regulation, financing, implementing, operating, monitoring, engagement, information sharing)	**Level of governance** (e.g., national government, province, city)

Table 5: Roles and responsibilities for water services provision

Name of the institution	**Nature of its role** (policy making, regulation, financing, implementing, operating, monitoring, engagement, information sharing)	**Level of governance** (e.g., national government, province, city)

Question 2 Please map all river basin organisations (RBO) in your Pilot Site or in (geographical) connection to it, according to the criteria below:

- **RBO**: name of the river basin organisation.
- **Sub-national**: sub-national governments (regional, provincial or local) represented in the basin organisation.
- **Role**: decision-making (decision on water resources management are taken within the RBO), deliberative (deliberate on water policy and issue recommendations for action), consultative (decision are consulted with the RBO), executive (execute the mandate of provinces or the federal government), etc. If none of these descriptions apply, please explain the role of the RBO (also provide relevant examples if appropriate).

- **Functions:** planning (e.g. design of river basin management plans), water management (e.g. allocation of water resources across users), monitoring (e.g. producing information or monitoring water quality), etc.
- **Source**: provide any relevant source (law, website, press article, scientific article, etc.) that can complement your answer.

Please use the table below to provide your answer. Add as many rows as needed.

RBO	**Regions, Provinces, Municipalities**	**Role**	**Functions**	**Adequate staffing (yes/no)**	**Adequate budget (yes/no)**

<u>Question 3</u> If appropriate, please provide information on how are River Basin Organisations are financed. *Please tick the appropriate box and specify where needed. Several answers are possible*

Financing mechanisms	Yes	No
Water charges in river basins		
Grants from national/federal government		
Grants from regional/provincial governments		
Other (specify)		

Question 4 Are there laws, either at national/federal or regional/provincial levels, regarding water resource management and water and wastewater service provision?

	YES	NO
Existence of laws on water resource management		
Existence of laws on water and wastewater service provision		

Question 5 Are there policies for water resource management and wastewater service provision, either at national/federal or regional/provincial levels?

	YES	NO
Existence of water resource management policy		
Existence of water and wastewater services provision policy		

Question 6 Please list the key legal and policy documents promoting regular monitoring and evaluation of water policy in your country (national and sub-national level where relevant).

	Tick the box	List federal laws	List provincial laws
Legal and policy documents promoting regular monitoring/evaluation			

Question 7 Is there an independent institution or public agency dedicated to the monitoring and evaluation of the implementation of national water policies? At which frequency are monitoring reports produced?

	YES	NO	Role of institution	Responsibilities of institution	Frequency of monitoring reports
Presence of independent institution/agency for monitoring/evaluation					

Question 8 Please specify whether the regulatory functions listed in the table are present in your country/province and specify the responsible authority that holds that function at the national or subnational level. Please fill one table for each province.

Function	YES	NO	Specify the responsible authority/ies at national or subnational level
Tariff regulation			
Quality standards for drinking water			
Quality standards for wastewater treatment			
Defining public service obligations			
Defining technical / industry and service standards			
Setting incentives for efficient use of water resources			
Setting incentives for efficient investment			
Promoting innovative technologies			
Promoting demand management			
Information and data gathering			

Monitoring of service delivery performance			
Customer engagement			
Consumer protection and dispute resolution			
Licensing of water operators			
Supervision of contracts with utilities / private actors			
Uniform systems of accounts e.g. for financial accounts			
Analysing water utilities' investment plans / business plans			
Supervising utilities' financing activities (e.g. issuing bonds, seeking equity investments)			
Carrying management audits on utilities			
Other (please specify…)			

Question 9 Are there regulatory agencies (national/subnational) in charge of environmental, economic and/or health water-related regulation? Please fill out the box below.

	YES	NO
Regulatory agencies (national/subnational) in charge of environmental, economic and/or health water-related regulation		

Part 1 - If yes, what are the roles and responsibilities of these agencies?

Name of the agency	Role and responsibility	Comments/Descriptions

Part 2. Transparency, accountability and financing

Please tick the box, if the statements listed are true for the regulation agencies. Please use the Comments box to provide further information.

Transparency, accountability & financing	**YES**	**NO**	**Comments/Descriptions**
Accountability to public bodies of their governance and outputs			
Transparency on possibility of stakeholder engagement			
Feedback to stakeholders on key decisions			
Possibility to appeal regulators' decisions in an easy, fair, timely way			
Existence of an ethics code			
Safeguarding regulators against lobbying			
Information on source of funding			
Autonomy in spending and managing budget			
External evaluation of the agency's spending is conducted by an independent body			
Transparency and accountability in nomination/appointment for the leadership of the regulatory agency			
Conflict of interest rules			

Grounds and process for terminating appointments clearly states in legislation			

Question 10 Is consultation with regulated entities before making a regulatory determination required by the existing legislation (either at national or subnational level)?

	YES	**NO**	**Comments/details**
Consultation with regulated entities			

Question 11 Is it required by law to make new regulatory measures available to the public (either at national or subnational level)?

	YES	**NO**	**Comments/details**
Availability of regulatory measures to the public			

Question 12 Have national or sub-national regulators articulated a procedure for consumers to follow when making complaints?

	YES	**NO**	**Comments/details**
Presence of procedure for consumers' complaints			

Question 13 Through which channels do customers mainly claim their rights (to the sector regulator; to the Government or to a Government agency; to the customer's association; to the ombudsman or similar entity; others)? Please tick the box.

Channels for consumers' rights	**Tick the box**	**Comments/details**
Sector regulator		

Government		
Government agency		
Customer's association		
Ombudsman (or similar entity)		
Others (please specify)		

Question 14 At the national level, are there legal guarantees for consumer access to information?

	YES	NO	If yes, please briefly describe those guarantees
Legal guarantees for consumer access to information			

Question 15 Are there public health regulations related to water quality?
If yes, are these health regulations effectively performed?
Please tick the relevant boxes.
Which institutions are in charge of water quality monitoring and enforcement for water supply and safe reuse of treated wastewater?
Please type the institution's name.

	YES	NO	Effectively performed	Institution name	Comments
Quality enforcement for water					
Safe reuse of treated wastewater					

Question 16 Which of the following economic instruments are in place to manage too much, too little and too polluted water at basin scale, and which institution is in charge of setting/collecting them? Please tick the yes/no box and provide the required information.

Economic instruments	Yes	No	Setting them	Collecting them
Bulk water tariffs				
Retail water tariffs/user charges				
Water abstraction charges				
Water pollution (effluent) charges				
Environmental tax				
Fines and penalties				
Levies				
Payments for ecosystem services				
Tradable/Marketable permits				
Other (Please, specify)				

Question 17 Are there pollution charges for domestic and non-domestic users and pollutants? Please describe if and how are they revised and enforced?

	YES	NO	Revision - enforcement
Pollution charges in place			
Pollution charges are monitored			
Pollution charges are enforced			
Pollution charges are revised			

Question 18 At national, sub-national or local levels, is there a multi-annual strategic plan that describes short-, medium- and long-term investment needs for the implementation of water resource management policy and water and wastewater services policy? Please attach the document if available.

Please specify.

Question 19 At sub-national government level, what are the strategies in place by those responsible for water policy to coordinate with those responsible for gender policies?

Existence of procedures for integrating gender concerns in water policy frameworks	Tick the box	Comments/Descriptions
Advanced		
In progress		
Emerging		
Not in place		

4.2 Assessment phase

4.2.1 *Mega-Trends & Resilience*

Question 20 Which of the following water risks are the most important in your territory?

Water Risk	YES	NO
Too much water (floods)		
Too little water (droughts, scarcity		
Too polluted water		
Degraded water ecosystems		
Ageing, obsolete water and sanitation infrastructure		
Competition, conflict over water allocation		
Insufficient coverage of water and sanitation services		

Question 21 Is there a flood or drought response and recovery strategy in place in your territory?

Water disaster response and recovery strategy	Tick the box	Comments/Descriptions
in place		
In progress		
Emerging		
Not in place		

Question 22 The recent Nature Resilience Law aims to restore habitats and species protected by the EU, stop the decline of pollinators by 2030, recover all green urban spaces, improve

biodiversity on farmland (e.g., grassland butterflies), restore drained peatlands, increase free-flowing rivers, enhance healthier forests, and restore seagrasses and sea bottoms.

How do you plan to incorporate the Natural Resilience Law at the national/subnational level? What are the strategies already in place or programmed for the future for each of the Nature Resilience Law points?
Please reply specifying whether the strategy/law has already been in place for the past 12 months, or whether this will take place in the future.

Nature Resilience Law	**Strategy/law in place or programmed**	**Institution/Ministry of reference**
Restore habitats/species		
Stop decline of pollinators		
Recover all green urban spaces		
Improve biodiversity on farmland		
Restore drained peatlands		
Healthier forests		
Free-flowing rivers		
Restore seagrasses and sea bottoms		

Question 23 Is there a biodiversity strategy in place in your country?

Biodiversity strategy	**Tick the box**	**Comments/Descriptions**
In place		
In progress		
Emerging		
Not in place		

Question 24

Part 1 — Green infrastructures are natural or semi-natural areas designed to deliver a range of ecosystem services. Are regulations in place to promote and develop green infrastructure and nature-based solutions?

	YES	NO	Provide examples
Regulations to promote/develop green infrastructures and nature-based solutions			

Part 2 —Are regulations in place to guarantee environmental flows through freshwater systems? If yes, how are they defined, monitored, enforced and revised?

Regulations regarding environmental flows	**YES**	**NO**	**Provide examples**
Environmental flows defined			
Environmental flows monitored			
Environmental flows enforced			
Environmental flows revised			

Question 25 What strategies are in place in your country to make the use of water more innovative?

Strategies for smart use of water	**Yes**	**No**	**If Yes, please provide examples**
Technologies for agriculture (e.g., irrigation, rainwater harvesting measures, aquaculture)			
Grey' sustainable infrastructures to protect from climatic variability and extreme weather events			
Study and training programs on innovative water uses (e.g., technical training on water quality monitoring)			

Reskilling programs for employees and job candidates in the water sector to build innovative competences			
Technologies for the recycling of water in urban areas			
Technologies for protecting ecosystems (e.g., seabeds)			
Technologies for removal of micro-plastics			
Research and innovation on sustainable energy (e.g., clean hydrogen)			
Digital access to information related to water			
Sustainable water transport			
Other (specify)			

4.2.2 *Policy, Institutions and Regulation*

Question 26 Please specify whether the following vertical co-ordination mechanisms or incentives that help coordinate the regulation of water services are present in your country/province. When possible, please provide details on how the mechanism/incentive works.

Vertical mechanisms/incentives	**YES**	**NO**	**Comments/Descriptions**
Financial transfers/incentives			
Performance indicators			
Shared information databases			
Sectoral conferences between federal and provincial regulators			
Other (please specify)			

Question 27 At national/federal government level, how large is the impact of obstacles to effective coordination between different administrative bodies in charge of water? Please tick the box.

Obstacles to horizontal co-ordination of water policy	**Impact of obstacle is of little importance**	**Impact of obstacle is of average importance**	**Impact of obstacle is very important**	I don't know
Likert scale	**1**	**2**	**3**	
Overlapping, unclear, non-existing allocation of responsibilities				
Intensive competition between different ministries (political rivalries etc.)				
Interference of lobbies				
Lack of high political commitment and leadership in water policy				
Lack of institutional incentives for co-operation (objectives, indicators etc.)				
Difficult implementation of central government decisions at local and regional levels				
Misuse of personal power for personal gain by some stakeholders at the time of decision-making				
Co-optation in the appointment of directors or staff				
Lack of continuity in policy approach due to changes in leadership, or following electoral process				
Other (specify)				

Question 28 Are there innovative ways to co-operate at local or sub-national levels (i.e. to pool resources and capacity, to build synergies across sectors, search for efficiency gains, etc.) notably through metropolitan governance, inter-municipal collaboration, urban-rural partnerships, or performance-based contracts? If so, please provide examples.

	YES	NO	Please describe and provide examples
Metropolitan governance			
Inter-municipal collaboration			
Urban-rural partnerships			
Performance-based contracts			
Other (please specify)			

Question 29 At federal government level, what are the bodies in charge of applying EU directives directly or indirectly linked to water policy?

	Responsible body	Specify how these bodies interact with each other
EU Biodiversity Strategy		
European Green Deal		
Urban Wastewater Treatment Directive		
Drinking Water Directive		
Floods Directive		
Water Framework Directive		
Nature Restoration Law		
UN Sustainable Development Goals		
EU Circular Economy Strategy		

Other (please specify)		

Question 30 What initiatives/policies are set up at the national or sub-national (e.g., regions, cities) to promote, support and develop the sustainable water use and its connection to the circular economy practices?

Initiatives/policies for the promotion/development of circular use of water	**YES**	**NO**	**If Yes, please provide examples**
Treated wastewater reuse			
Production of biogas, biomethane			
Recovery of sludge nutrients			

Question 31 How is the influence of the following policy areas on water resource management and/or water and wastewater service provision in reference cities?

Policy Areas	**Significant obstacle**	**Moderate obstacle**	**Insignificant but present obstacle**	**Not an obstacle**
Land use and spatial planning				
Building codes and housing				
Transportation				
Solid waste management				
Energy				
Agriculture				
Territorial (rural, urban, regional) development				

Question 32 WHO Guidelines for drinking-water quality recommend water safety plans (WSP). Across EU, the WSP approach is increasingly being adopted by water suppliers and included in national drinking-water regulations as a benchmark for the delivery of safe drinking-water.
Does your country comply with the regional and global frameworks on use of risk-based approach?

	YES	NO	Comments
Risk-based approach for health-based norms (e.g., drinking water parameters are updated and monitored) is present in the country.			
The risk-based approach is used by service operators/utilities.			
Risk-based approach for health-based standards in wastewater and fecal discharge, handling, reuse.			

Question 33 Is there a mechanism to support solidarity between urban and rural water users? Is there a priority allocation of water between water users?
Please specify below or provide those assessments if available.

	Tick the box	Please provide examples
Solidarity between urban and rural water users through cross-subsidies mechanisms		
Priority allocation of water between sectors		

Question 34 Are regulations/policies in place to guarantee clean water and sanitation for women and girls and those in vulnerable situations? Please specify the information with reference to the last 12 months.

Clean water regulation for women, girls and vulnerable groups	Tick the box	Please describe the existing regulations and policies
Advanced		

In progress		
Emerging		
Not in place		

Question 35 In your country, what are the public bodies specialized in fostering innovation in the water sector? Please fill out the table below.

Name of the institution	**Nature of its role** (financing, sharing feedback, incentivising, assessing)	**Level of governance** (e.g., national government, province, city)

Question 36 To what extent are cultural values of water safeguarded and accounted for in water policies? Please specify by ticking options 1 to 5, where 1 indicates the lowest level engagement to safeguarding cultural values and 5 indicates the highest level of engagement. Please also provide a few examples.

	1	**2**	**3**	**4**	**5**	**Please provide examples**
Cultural values of water						
Recreational (e.g., fishing, sport)						
Religion (e.g., cleansing and purification value of water, fertility)						
Economic development (e.g., safe drinking water, livelihood)						
Scenic beauty (e.g., happiness and improved mental health)						

Political and identity value (e.g., Indigenous opposition to dams)						
Gender-typical values (e.g., access to clean water for hygiene purposes associated with period)						

Question 37 Which of the following capacity gaps impeding water management?

Capacity gaps	YES	NO	Please briefly describe
Lack of staff, competence or training			
Poor planning and not articulated with national objectives			
Lack of knowledge on water (technical, financial…)			
Other, please specify			

Question 38 Are there incentives implemented to create water careers in the public and private sectors?

Incentives for water careers	YES	NO
Synergies between universities and the public sector		
Existence of educational programs on water science or management (e.g., university level)		
Partnerships between universities and private water operators		
Other (specify)		

Question 39 To what extent are water related institutions knowledgeable about gender issues?

Knowledge of water related institutions on gender issues	Tick the box	Comments/Descriptions
Advanced		
In progress		
Emerging		
Not in place		

4.2.3 *Financing*

Question 40 Are sources of finance raised to support access to water and sanitation for vulnerable categories, including women, children, disabled, and migrants?

Financial sources for vulnerable categories	YES	NO	If yes, please describe these sources of finance, and specify if these are at the federal or subnational level (e.g., cities)	I don't know
Implementation of water and/or wastewater social tariffs?				
Public budget funding used to support/finance access to water and sanitation for vulnerable categories?				
Other (specify)				

Question 41 Are there social tariffs or other supporting measures implemented for vulnerable categories of water users (e.g., women, youth, disabled, migrants) in urban and rural areas?

Social tariffs/other supporting measures for:	Tick the box		Comments/Descriptions
	Urban areas	Rural areas	

Women			
Youth			
Disabled			
Migrants			
Other (please specify)			

Question 42 Are sources of finance raised to protect ecosystems (e.g., subsidies for fishermen to avoid overexploitation of seabed, by-catch, etc)?

Financial sources for ecosystems	**YES**	**NO**	**If yes, please describe these sources of finance, and specify if these are at the federal or subnational level (e.g., cities)**
Environmental tax			
Environmental charge			
Water and/or wastewater tariff			
Other (specify)			

Question 43 To what extent are there financial revenues dedicated to the use of 'green' technologies (e.g., technologies to recycle water, sustainable buildings and transport)?

Financial revenues for green water technology	**Tick the box**	**Comments/Descriptions**
Advanced		
In progress		
Emerging		
Not in place		

Question 44 To what extent are financial revenues dedicated to disasters response (climate resilience)? Are sufficient financial resources easily accessible and disbursed quickly for disaster recovery and continuity following shock events or persistent stresses?

Budget for response and recovery plans	Tick the box	Comments/Descriptions
Advanced		
In progress		
Emerging		
Not in place		

Question 45

	YES	NO	Comments/Descriptions
Financial resources are easily accessible and disbursed quickly			

Question 46 To what extent are there financial revenues dedicated to raising awareness and knowledge on water (e.g., training programs, support to teachers)?

Culture of water' financing	Tick the box	Comments/Descriptions
Advanced		
In progress		
Emerging		
Not in place		

Question 47 Are 'green' bonds in place in your country?

	YES	NO	Comments/details
Presence of green bonds in your country			

Question 48 Is there a dedicated budget set for rural areas, more vulnerable to climate change and natural disasters (e.g., floods, droughts), as well as more prone to help save biodiversity?

Funds for rural areas	Tick the box	Comments/Descriptions
Advanced		
In progress		
Emerging		
Not in place		

Question 49 In your country, are there incentives for innovative financing in the water sector (e.g., tax credits, public-private partnerships, etc.)?

Incentives for innovative financing	YES	NO	Provide examples
Tax credit			
Public-private partnerships			
Voluntary contributions (based on willingness to pay, for instance)			
Extended producer responsibility			
Other (specify)			

4.2.4 Data, Monitoring & Evaluation

Question 50 Data and information on water services provision (WSS).

Part 1. Is the following type of information/document described below available and its source (Excel files, official reports, datasets, etc.).

Document on the following data	Tick the box if information/document is available	Type of document	Source/Link	Comments/Descriptions

Access to safe water (collective services) and access to improved sanitation (collective services, individual systems)				
Household expenditures for water supply and sanitation. For instance, share in households' income for the lowest decile or quintile				
Share of revenues from tariffs and public budget in financing water supply and sanitation services				
Knowledge of assets: age of the infrastructure (e.g. % of infrastructure with 1-10 year, % with 10-20 years, % with 20-30 years, % with 30-40 years, % above 40 years), number of breaks per km a year, or other relevant information				
Drinking water and wastewater quality controls against specified standards				
Statistics on organic matter, nitrogen, phosphorus, other micro-pollutants, and micro-plastics detected in freshwater in both urban and rural areas				
Strategies for detecting pathogens in wastewater				

Part 2. Which of the following information gap do you face regarding WSS information system?

Potential information gap	**YES**	**NO**	**Comments/Descriptions**

Complexity (e.g., overlapping of data)			
Lack of continuity (e.g., missing data, data loss)			
Impossibility to secure information (e.g., no backups)			
Lack of digitalization of documents			
Impossibility to integrate new and old documentation			
Presence of low-quality data			
Outdated equipment/software			
Lack of trained personnel to manage data			

Part 3. Please tick the box on whether the WSS information system is harmonised, integrated, standardised and how it is co-ordinated across responsible authorities/actors (ministries, regulators, services providers, etc.).

Characteristics of the WSS information system	**YES**	**NO**	**Responsible authority/actors**	**Comments/Descriptions**
Harmonised (i.e., data from different sources are transformed to make them as comparable as possible)				
Integrated (i.e., data from different sources are transformed to be combined, avoiding repetitions of data and unnecessary information)				
Standardised (i.e., data from different sources are converted into one common format)				

Question 51 Data and information on integrated water resources management (IWRM).

Part 1. Is the type of information/document described below available and its source (Excel files, official reports, datasets, etc.).

Document on the following data	Tick the box if document is available	Type of document	Source/Link	Comments/Descriptions
% of users formally registered for water withdrawal				
Withdrawals and consumption by sectors (domestic, energy, agriculture, industry)				
Reports and data on reused and recycled water in various sectors				
Water abstraction and pollution charges collected, and subsidies given				
Information on hydrogeological resources (e.g., abstraction of gravel, sand, deep sea mining)				

Part 2. Which of the following information gap do you face regarding IWRM information system?

Potential information gap	YES	NO	Comments/Descriptions
Complexity (e.g., overlapping of data)			
Lack of continuity (e.g., missing data, data loss)			
Impossibility to secure information (e.g., no backups)			
Lack of digitalization of documents			
Impossibility to integrate new and old documentation			

Presence of low-quality data			
Outdated equipment/software			
Lack of trained personnel to manage data			

Part 3. Please tick the box on whether the IWRM information system is harmonised, integrated, standardised and how it is co-ordinated across responsible authorities/actors (ministries, regulators, services providers, etc.).

Characteristics of the IWRM information system	**YES**	**NO**	**Responsible authority/actors**	**Comments/Descriptions**
Harmonised (i.e., data from different sources are transformed to make them as comparable as possible)				
Integrated (i.e., data from different sources are transformed to be combined, avoiding repetitions of data and unnecessary information)				
Standardised (i.e., data from different sources are converted into one common format)				

Question 52 Data and information to support water risk management.

Part 1. Is the type of information/document described below available and its source (Excel files, official reports, datasets, etc.).

Document on the following data	**Tick the box if document is available**	**Type of document**	**Source/Link**	**Comments/Descriptions**
Projections/scenarios with reference to climate change and the risks of floods, drought and pollution				

Statistics on technologies/digital tools/models used to make projections related to water risk management, as well as address shocks and stresses				
Historical data or reports on water disasters and/or extreme weather events (e.g., cyclones, droughts, excessive precipitations) and other meteorological data linked to climate change (e.g., melting glaciers, ocean acidification)				
Information on vulnerability (human beings and properties)/exposure to risk, including seasonal migration				
Information on risks for vulnerable categories, including women, children, disabled, migrants				

Part 2. Which of the following information gap do you face regarding water risk management information system?

Potential information gap	**YES**	**NO**	**Comments/Descriptions**
Complexity (e.g., overlapping of data)			
Lack of continuity (e.g., missing data, data loss)			
Impossibility to secure information (e.g., no backups)			
Lack of digitalization of documents			
Impossibility to integrate new and old documentation			
Presence of low-quality data			
Outdated equipment/software			

Lack of trained personnel to manage data			

Part 3. Please tick the box on whether the water risk management information system is harmonised, integrated, standardised and how it is co-ordinated across responsible authorities/actors (ministries, regulators, services providers, etc.).

Characteristics of the risk management information system	**YES**	**NO**	**Responsible authority/actors**	**Comments/ Descriptions**
Harmonised (i.e., data from different sources are transformed to make them as comparable as possible)				
Integrated (i.e., data from different sources are transformed to be combined, avoiding repetitions of data and unnecessary information)				
Standardised (i.e., data from different sources are converted into one common format)				

Question 53 Are there documents and data related to gender topics in the water sector?

Existence of documents and data related to gender-specific content in the water sector	**Tick the box**	**Comments/Descriptions**
Advanced		
In progress		
Emerging		
Not in place		

Question 54 Which mechanisms are used to assess the performance of urban water services and urban water management and how often are they used?

Evaluation mechanisms	Yes, very often	Yes, often	Yes, sometimes	Yes, very rarely	Never
Survey, Poll (citizens' satisfaction, etc.)					
Benchmark (Key performance indicators)					
Evaluation report (effectiveness, efficiency, impact…)					
Ex-post financial analysis (e.g. Cost-Benefit Analysis)					
Regulatory tools and reporting					
National observatory					
Other – please specify					

Question 55 To what extent have the monitoring and evaluation of water policy in your country been digitalized?

Digitalization of monitoring and evaluation of water policy	Tick the box	Please specify/describe
Advanced		
In progress		
Emerging		
Not in place		

Question 56 Are data and reports of monitoring and evaluation of water policy available and accessible to the public? Through what means?

	YES	NO	If YES, specify how
Data/reports of monitoring/evaluation of water governance are publicly accessible			

Question 57 Are there agreed-upon key performance indicators for the monitoring and evaluation of water policy related to the circular economy practices? Are these at national or subnational level (e.g., cities)?

	YES	NO	Provide examples
Key indicators for monitoring/evaluation of circular economy practices in water policy at national level			
Key indicators for monitoring/evaluation of circular economy practices in water policy at subnational level			

Question 58 Are there agreed-upon key performance indicators for the monitoring and evaluation of water policy related to a socially fair and inclusive use of water (e.g., women, the poor)?

	YES	NO	Provide examples
Key indicators for monitoring/evaluation of socially fair and inclusive water use			

Question 59 What are the obstacles encountered to monitor and evaluate water-related initiatives linked to a circular economy practices from a national or sub-national perspective?

Monitoring obstacles for water-related 'circular 'activities	**Tick the box**	**Please provide examples**
Lack of precise definition of circular economy		
Lack of harmonized indicators across governance levels		
Data gaps and inconstancies		
Conflicting strategies at the different levels of governance		
Lack of systemic approach (i.e., indicators measure several factors not just e.g., waste management)		

Lack of indicators on the intelligent use of goods (e.g., planned obsolescence and easing repair)		
Some sectors are characterized by data unavailability		

4.2.5 *Engagement & Accountability*

Question 60 To what extent are women participating in the national instances for the management of water?

Presence of female board members in national water commissions/authorities that participate in decision-making process on management of waters	Tick the box	Comments/Descriptions
Advanced		
In progress		
Emerging		
Not in place		

Question 61 At federal government level, what are the strategies in place to coordinate with those responsible for gender policies?

Existence of procedures for coordinating national ministries dealing with water and national ministries dealing with women's welfare	Tick the box	Comments/Descriptions
Advanced		
In progress		
Emerging		
Not in place		

Question 62 Are there mechanisms implemented to ensure female participation in water related engagement?

Female participation in water related topics engagement	Tick the box	Comments/Descriptions
Advanced		
In progress		
Emerging		
Not in place		

Question 63 To what extent are the following 'cultural' activities related to water regulated to safeguard the environment? Please tick the box.

Regulation of cultural activities	Advanced	In progress	Emerging	Not in place
Hunting				
Recreational fishing				
Educative value to water				
Recreational value (e.g., water sports, tourism)				
Heritage				

Question 64 Which laws, rules or other legal texts hold decision-makers and stakeholders accountable through obligations, such as the right to information or public procurement procedures, etc.? Please provide the legal text if available.

Please specify.

Question 65 Are there independent authorities to investigate water related and law enforcement breaches? Please explain its area of action, and provide any source available.

Please specify.

Question 66 Are there mechanisms that help resolve disputes between public authorities and water operators? Please specify whether yes or no and provide some examples.

	YES	NO	If yes, please briefly describe the mechanisms
Mechanisms for disputes between public authorities and water operators			

Question 67 In your country, are anti-corruption plans implemented for the water sector? At what level?

Anti-corruption plans	Yes	No
National		
Provincial		
Basin		
City		

If Yes, please provide examples.

Question 68 Do state-owned enterprises observed high standards of transparency and are subject to the same high-quality accounting, disclosure, compliance and auditing standards as listed companies?

State-owned enterprises integrity	Tick the box	Comments/Descriptions
Advanced		
In progress		
Emerging		
Not in place		

Question 69 To what extent do the following obstacles hinder transparency and accountability of water management?

Transparency and accountability gap	Major obstacle	Important obstacle	Somewhat an obstacle	Not an obstacle
Lack of publicly available data on drinking water quality				
Lack of publicly available data on economic and financial performance, included costs of service				
Lack of accounting control through regular financial audits				
Lack of benchmarking to evaluate water quality, quantity and service providers' performance				
Lack of competitive procurement processes				
Weak judicial system for conflict resolution				
Limited information sharing across local authorities				
Limited monitoring / evaluation guiding decision-making				
Weak stakeholder engagement in water policy and projects				
Other, please specify				

Question 70 How are stakeholders consulted in the process of developing water policies at the national level?

Please provide examples or a document explaining the process of their engagement.

Question 71 How are vulnerable and under-represented categories involved in the process of designing and implementing water policies, as well as newcomers?

Youth, women, disabled, migrants	Tick the box	Comments/Descriptions/Examples
Advanced		
In progress		
Emerging		
Not in place		

Question 72 To what extent are scientific experts involved in the process of designing and implementing water policies, especially as regards new technologies for the water sector?

Engagement of scientific experts	Tick the box	Comments/Descriptions/Examples
Advanced		
In progress		
Emerging		
Not in place		

Question 73 Have the following categories of stakeholders been involved in the design and implementation of water policies that are in line with an idea of circular economy (e.g., recycling of water, renewable water cycle energy)? If they are currently not involved but they are planned to be involved in the future, please specify when this will happen (short-, medium-, long- term).

Category of stakeholder	Yes	No
Government:		
Supranational		
National		
Regional		
Local		
Civil society:		
Customers and their associations		
Citizens		
NGOs		
Association representing the interest of specific groups (e.g. ethnic minorities, women, disabled, elderly people, young people, etc.)		
Private sector:		
Business/ Industry		
Business associations		
Financial actors:		
Banks		
Private investors and foundations		
International financial institutions		
Other stakeholders:		
Service providers		
River Basin Organisations/ Committees		

Category of stakeholder	Yes	No
Science, academia and research centres		
Media		
International organisations		
Other, please specify:		

Question 74 Which of the following mechanisms are used to engage stakeholders in water-related decision-making?

Mechanism	Yes	No
Sub-national institution dealing specifically with water (e.g. river basin organisations, water agency, etc.)		
Water associations		
Contractual arrangements		
Decentralised assemblies (e.g. boards of directors of basin agencies)		
Survey/ Polls/ Referendum		
Hotlines		
Consensus conferences		
Shareholding (public, private, both)		
Consultations in regulatory processes		
Workshops / Fora		
Regular meetings		
Ad hoc meetings		
Expert panels		
Focus groups		
Citizen committees		

Inter-ministerial consultations		
Traditional media- newspaper, newsletter, TV, Radio-		
Web-based communication technologies (online platforms, e mail, social media, website, app, etc.)		
Decentralised cooperation mechanisms		

Question 75 In your country, are there innovative water governance practices at any level (national, provincial, basin, city) that promote social learning to facilitate dialogue and consensus-building?

For example, through networking platforms, social media, Information and Communication Technologies (ICTs) and user-friendly interface (e.g. digital maps, big data, smart data and open data). If so, please provide examples.

	YES	NO	Provide examples
Networking platforms on water-related topics			
Social media specifically dealing with water-related topics			
Digital maps on water-related topics			
Smart data on water-related topics			
Open data on water-related topics			
Other (please specify)			

Question 76 To what extent are households informed on water pricing? Are strategies in place to understand their willingness to pay for water?

Strategies to inform households on pricing of water	Tick the box	Comments/Descriptions
Advanced		
In progress		

Emerging		
Not in place		

Question 77 What practices are put in place to guarantee that the following human rights with regards to water are respected.

Practices for human rights to water	Tick the box	Comments/Descriptions
Availability: The water supply is continuous and sufficient for everyone.		
Accessibility: Facilities are easily and safely accessible.		
Affordability: Water services are affordable to everyone.		
Acceptability: Facilities for water and sanitation are culturally acceptable, sensitive to gender, life cycle and privacy requirements.		

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- European Green Deal
- Urban Waste Water Treatment Directive
- Drinking Water Directive
- Floods Directive
- Water Framework Directive
- Nature Restoration Law
- UN Sustainable Development Goals

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