

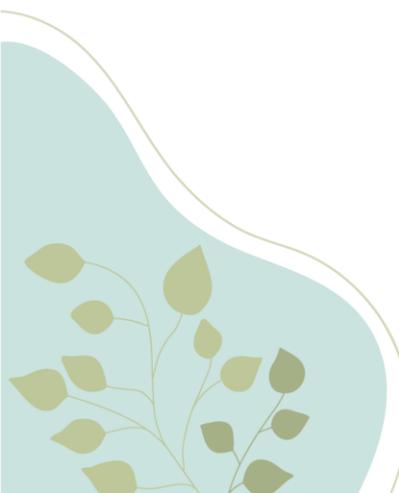
# PROCEEDINGS FROM THE CONSULTATIVE WORKSHOPS

Water4All SRIA update process

Deliverable D1.7, October 2024



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## Deliverable D1.7: Proceedings from the consultative workshops

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## LIST OF ACRONYMS

<b>AI</b>	Artificial Intelligence
<b>ANBS</b>	Advanced Nature Based Solutions
<b>API</b>	Application Programming Interface
<b>Biodiversa+</b>	European Biodiversity Partnership
<b>CAP</b>	Common Agricultural Policy
<b>CEO</b>	Chief Executive Officer
<b>COP15</b>	15 <sup>th</sup> Convention of Biological Diversity
<b>DSS</b>	Decision Support Systems
<b>EOSC</b>	European Open Science Cloud
<b>EU</b>	European Union
<b>FAIR</b>	Findable, Accessible, Interoperable and Reusable
<b>GBG</b>	Global Biodiversity Framework
<b>GIS</b>	Geographical Information Systems
<b>IoT</b>	Internet of Things
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>JPI</b>	Joint Programming Initiative
<b>MOOC</b>	Massive Online Open Courses
<b>NBS</b>	Nature Based Solutions
<b>NGO</b>	Non-Governmental Organisation
<b>PRIMA</b>	Partnership on Research and Innovation in the Mediterranean Area
<b>R&amp;I</b>	Research and Innovation
<b>SDG</b>	Sustainable Development Goal
<b>SMEs</b>	Small and Medium-Sized Enterprises
<b>SRIA</b>	Strategic Research and Innovation Agenda
<b>UN</b>	United Nations
<b>Water4All</b>	European Partnership on Water Security for the Planet

## EXECUTIVE SUMMARY

The Water4All's Strategic Research and Innovation Agenda (SRIA) lays out topics for which research and innovation is recommended in order to secure water for all. The SRIA was published in September 2022 and an update version will be delivered at the end of 2025. In this context, and as part of its Pillar A, Water4All partners have initiated a SRIA update process that will involve the review of numerous information sources, the launch of a public consultation, a foresight exercise, **and the organisation of two stakeholder consultative workshops.**

**This deliverable contains the proceedings of the two stakeholder consultative workshops, held in Helsinki (February 2023) and in Lisbon (June 2024).** Each one of these workshops gathered more than 30 experts and they enabled a better understanding of remaining knowledge gaps in the fields of ecosystems and biodiversity (first workshop) and the use of digital tools in the water sector (second workshop). Workshop participants included scientific experts, policy-makers and water managers, and representatives of water utilities. The organisation of these two consultative workshops responds to the overall objective of giving a voice and involving stakeholders in the definition of the strategic orientations of the Water4All in order to enhance the buy-in of future proposed solutions, approaches and recommendations for securing water for all.

Given the number of participants, discussions took place in breakout group sessions. The key outputs of results were put together in plenary sessions. The insights provided by participants will not only feed the next version of the Water4All's SRIA but also the identification of additional activities that could be implemented by Pillars. This deliverable provides a comprehensive description of the different proposals made by participants but a number of points were highlighted in both workshops. The importance of **improving monitoring** was brought up during discussions. The potential of remote sensing needs to be further seized as well as the combination of data from different data collection methods. In this regard, data accessibility came up as a main issue to be addressed in the future. Even though more and more data become available, it is not always accessible or usable because of its heterogeneity, fragmentation or data security and data ownership issues. **Data sharing and data standardisation** constitute then two key strategic areas that should be promoted and enabled by Water4All.

Another aspect to stress from discussions concerns the **set-up of baselines and targets** in order to develop a better understanding of the current status (baselines) and objectives when it comes to water quality or restoration measures (targets). Activities in this area would be of great benefit in the implementation and evaluation of nature restoration measures and circular economy, to cite just the examples provided by participants. Establishing new ecological status/ baselines was particularly highlighted during the workshop in Helsinki, which would come to support the new EU Nature Restoration Law.

Other than supporting research and innovation activities for tackling these remaining knowledge gaps, participants recommended Water4All partners to concentrate efforts on bridging the science-policy interface to ensure the uptake of proposed solutions in the implementation of policies, demonstration actions through living labs, improved communication to different types of audiences, capacity-building and capacity-development through dedicated educational programmes, and stakeholder engagement thorough the design and implementation of strategic orientations. The use of a holistic approach integrating different disciplines (from natural sciences to social sciences) and across spatial scales was pointed out as a crucial approach to be encouraged by Water4All. **Some of these recommendations are of particular interest in the framing of joint calls for proposals.**

The Proceedings of consultative workshops have been communicated to all workshop participants. They will also be sent out to other running initiatives pertaining to the Water4All's domain; amongst others, the PRIMA programme, the ICT4WATER cluster and the European Biodiversity Partnership. This will allow the sharing of information and the reinforcement of synergies between programmes.

No more consultative workshops at the European level are planned. However, some countries will hold national seminars. The outputs of those seminars will also be considered in the update process of the Water4All's SRIA.

# PROCEEDINGS FROM WATER4ALL STAKEHOLDERS CONSULTATIVE WORKSHOPS

## INTRODUCTION

### WATER4ALL IN A NUTSHELL

The **Water4All Partnership** ([www.water4all-partnership.eu](http://www.water4all-partnership.eu)) is a Research and Innovation (R&I) programme co-funded by the European Commission under the framework of Horizon Europe. It aims to enable water security in the long term by **boosting systemic transformations and changes across the entire water research – innovation pipeline**, fostering the matchmaking between problem owners and solution providers.

Launched in June 2022, Water4All is a seven-year programme although some activities will extend till 2032. The programme will support a wide portfolio of multi-national and cross-sectoral activities, from physical and biological sciences to human and social sciences. All these activities have been grouped into different categories, leading to the structuring of Water4All into six different operational Pillars:

- Pillar O for the overall coordination and management of the programme.
- Pillar A, aiming to define Water4All's strategic orientations and establish communication, dissemination and exploitation tools.
- Pillar B, seeking to generate knowledge through the pooling of financial resources from funding agencies participating in the Partnership.
- Pillar C, promoting the uptake of results from research and innovation activities through science-policy interface actions and capacity building.
- Pillar D, supporting demonstration activities and enhancing access to the market of R&I solutions.
- Pillar E, addressing international cooperation opportunities.

As of September 2024, the **Water4All Partnership** brings together a group of 90 partners from 33 countries in the European Union and beyond (Brazil, Georgia, Israel, Moldova, Norway, South Africa, Switzerland, Turkey, Tunisia, United Kingdom). The partnership is coordinated by the French Research Agency (ANR, in French). The consortium has been strategically conceived in order to gather partners covering the whole water R&I chain including academia, R&I funders, water management authorities, water utilities and water associations. Moreover, partners will collaborate with other R&I initiatives in the European Research Area in order to enhance the impact of planned activities. Amongst others, collaboration is already taking place with EU Missions, like the Mission "Restore our Ocean and Waters by 2030", and other Horizon Europe Partnerships such as the ones on Biodiversity, Sustainable Blue Economy and Driving Urban Transitions.

The expected outcomes of **Water4All** include:

- Strengthening the water R&I collaboration and strategic coordination for the conservation, restoration, regeneration and best use of the natural functions of groundwater, surface water and dependent or associated ecosystems.
- Supporting and promoting demonstration and access to the market of innovative solutions.
- Communicating water-related knowledge and data through open access.
- Providing tools for water management through innovative knowledge, methodologies and tools.
- Designing and implementing approaches for the participatory, accountable and transparent development of innovation whilst ensuring the empowerment and capacity development of communities.

## PILLAR A: SETTING THE STRATEGIC ORIENTATIONS OF WATER4ALL

Pillar A is responsible for setting out the **strategic orientations and decisions of the programme**. As depicted in the Figure below, Pillar A is structured around three Tasks. Pillar A's efforts will translate into:

- The development and update of the **Water4All's Strategic Research and Innovation Agenda (SRIA), which delineates the water topics that should be addressed through different activities for securing water for all**. The document also provides a detailed analysis of thematic synergies with other R&I initiatives, including other Horizon Europe Partnerships, Missions or Articles 185. A first version of the SRIA is available since September 2022 at: [https://www.water4all-partnership.eu/sites/www.water4all-partnership.eu/files/2023-02/Water4All\\_SRIA-2022-2025\\_A4\\_2311\\_bd.pdf](https://www.water4all-partnership.eu/sites/www.water4all-partnership.eu/files/2023-02/Water4All_SRIA-2022-2025_A4_2311_bd.pdf)

Further information on the SRIA and its update process is provided in the section below.

- A comprehensive mapping of water R&I programmes, policies and funding schemes, water related projects and R&I performers that will enable a better understanding of emerging trends, research priorities and areas where targeted investments can have greatest impact on addressing water challenges and achieving the objectives of Water4All. The mapping exercise will also identify existing constraints in the promotion of transnational collaboration. Activities will also lead to a better understanding of the actual influence of Water4All in the development of water policies in each of the countries/ regions participating in the programme.
- Delivery of tools for the global outreach of activities and the dissemination of results to relevant end-users e.g. water management authorities, market sector.

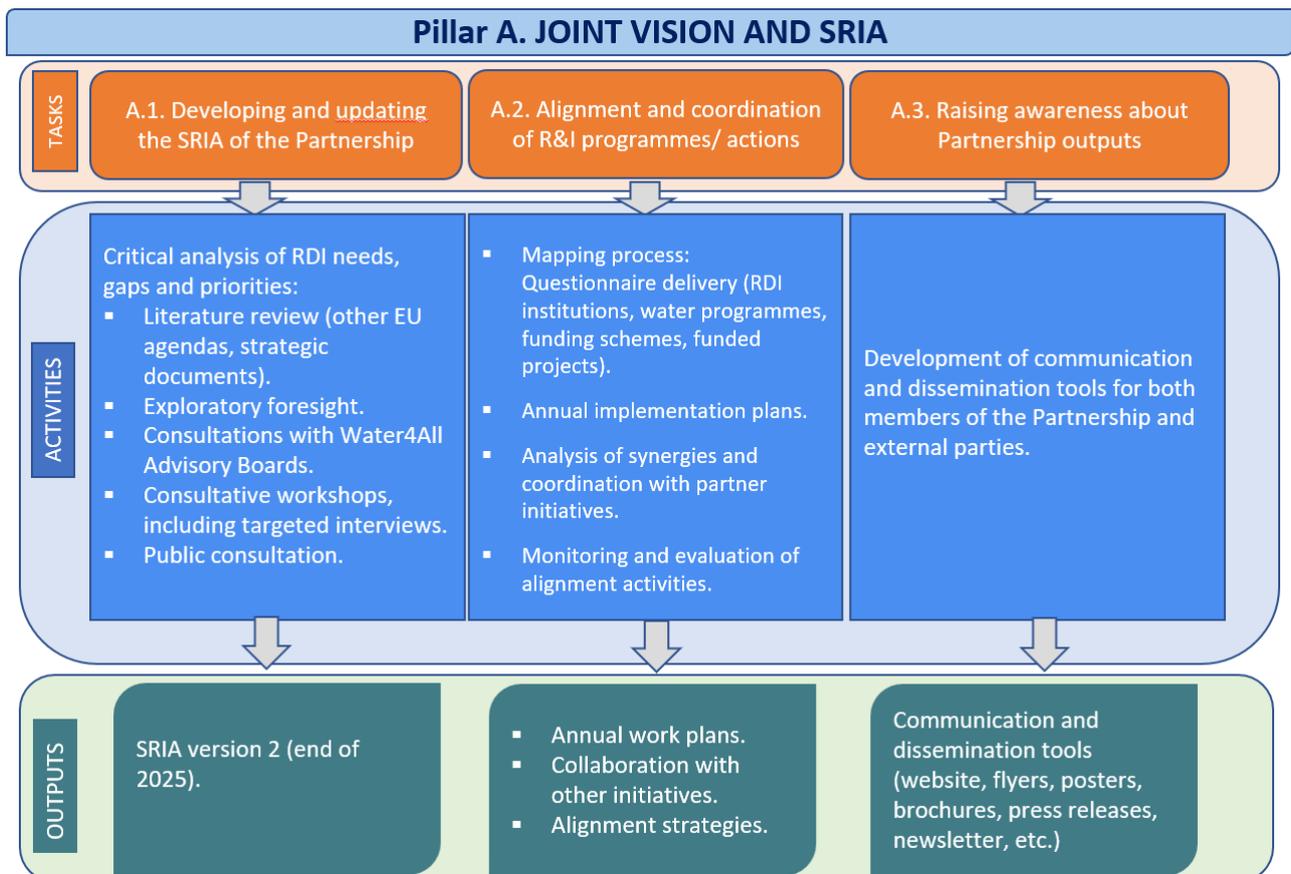


Figure I. Structure of Pillar A, activities and expected outputs.

## WATER4ALL’S SRIA: MAIN CONTENTS AND UPDATE PROCESS

The SRIA is a key strategic document for Water4All as it offers a **comprehensive understanding of specific areas in which knowledge gaps persist and for which further R&I is recommended**.

**All the knowledge gaps listed in the SRIA are presented as water topics for research and innovation** and grouped into different themes according to the domain they pertain. The Water4All’s SRIA identifies then seven key themes, shown in **Figure II**.

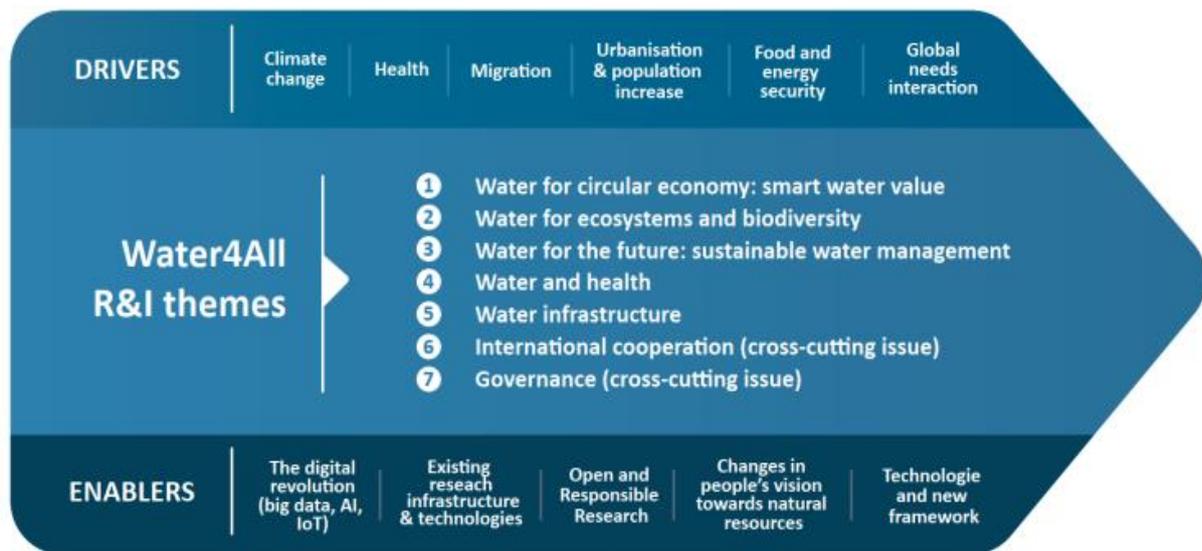


Figure II. Water4All’s R&I themes, drivers and enablers.

The SRIA also identifies drivers and enablers, as specific factors that may play a major role in the delineation of Water4All’s thematic orientations. One of the drivers is “**digital revolution (big data, AI, IoT)**”.

Our world is rapidly changing. Climate change seems to accelerate at great pace and recent geopolitical and health events call for new measures to guarantee water supply for all. **The Water4All’s SRIA needs to take on-board these emerging needs as well as latest scientific breakthroughs. It is for this reason that partners are currently working on an updated version of the SRIA that will be released at the end of 2025.** This update process will be based on a participatory approach in which different types of stakeholders and experts will be invited to provide their insights and views on water topics that should be included in the SRIA. As part of the SRIA update process, **partners have organised a comprehensive review of water information sources (sub-Task A.1.1), a foresight exercise (Task A.1.2), two consultative workshops (Task A.1.3) and a public consultation (sub-Task A.1.4).** The mapping exercise, as part of the Task A.2, will also provide some elements for the SRIA update process.

Stakeholder consultative workshops play an essential role in the update of the SRIA by ensuring that it is comprehensive, socially relevant, and reflective of the current needs of society, industry, and research communities. Through these consultative workshops, partners have gathered input from a diverse group of stakeholders, including researchers, policymakers, civil society organisations, and end-users. **This diversity of perspectives will ensure that the upcoming SRIA does not become too narrow or disconnected from real-world challenges.** Moreover, it enables to **capture insights on emerging trends and future challenges** that might otherwise be overlooked, allowing for more innovative and holistic solutions to complex water related problems.

Stakeholder consultative workshops also provide a **forum for sharing knowledge**, making of the SRIA a living document that evolves with innovative solutions, emerging market changes, and evolving societal expectations. Additionally, they ensure that the **research and innovation priorities outlined in the SRIA are aligned with the needs and expectations of the stakeholders that will be affected by them**. Industry representatives can highlight practical challenges, while policymakers can provide regulatory insights and societal actors can voice public concerns. This alignment increases the feasibility of implementing the agenda and boosts stakeholder buy-in, which is essential for its success. When stakeholders feel heard and engaged in the process, they are more likely to support and invest in the outcomes, leading to more effective and sustainable innovation strategies.

In this context, the specific objectives of the stakeholder consultative workshops have been:

- Gathering experts' views on the contents of the SRIA and missing knowledge gaps whilst also understanding their concerns and suggestions on the topics of discussion.
- Identifying ideas and recommendations for the upcoming version of the SRIA.
- Engaging different types of stakeholders in the workshop to help foster relationships, build trust, and increase their sense of ownership and commitment throughout the programme.

This deliverable contains the main results of the two consultative workshops held by Water4All since its launch in June 2022 (first Grant Agreement period of the partnership). This report has been prepared based on the Proceedings of each one of the workshops, which have been reviewed by all participants from both within and outside the Water4All Partnership consortium.

## METHODOLOGY

As indicated above, two consultative workshops have taken place. The first one took place in Helsinki (Finland) in February 2023 on the theme “**Water for ecosystems and biodiversity**” (Theme II of the Water4All’s SRIA), including monitoring tools, ecosystem restoration and ecosystem services. The second consultative workshop was held in Lisbon (Portugal) in June 2024 on the theme “**Digital tools and data for smart water management**”.

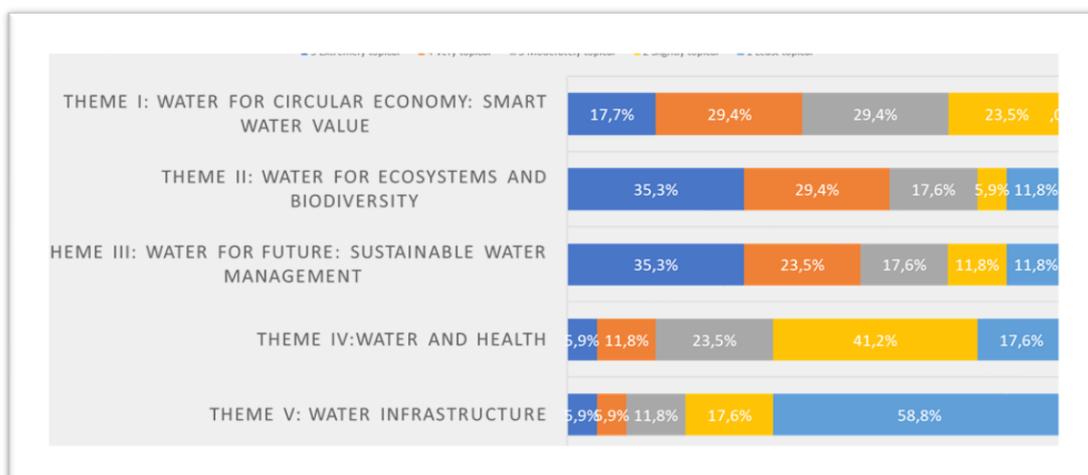
### FIRST STAKEHOLDER CONSULTATIVE WORKSHOP, February 2023

The 2023 Water4All Consultative Workshop was organised by the Research Council of Finland, AKA (former Academy of Finland), with the support of Water4All partners and Water4All secretariat. Active planning and preparations for the workshop started in August 2022, seven months before the workshop was held. The aims and practical arrangement of the Workshop was discussed within Task A.1.3 meetings and dedicated workshop meetings (all online) during autumn 2022-early 2023.

The theme of the workshop (“Water for ecosystems and biodiversity”) was selected following a survey to all Task A.1 partners (mailing list of 54 people at the time) in September 2022. The Research Council of Finland received 22 answers in total, 17 from Task members and 5 additional answers from local experts of South Africa. The relevance of this theme was justified e.g., as follows: “*Biodiversity and ecosystem disruption in the water and freshwater fields are of key concern and have cascading effects in food and health security*”. Furthermore, the two cross-cutting themes of the Water4All’s SRIA (international cooperation and governance) were included in the different discussions. It should be noted that the theme II – Water for ecosystems and biodiversity – is broken down into four sub-themes, namely:

- Sub-theme II.I: Functioning and biodiversity
- Sub-theme II.II: Resilience, mitigation and adaptation of aquatic ecosystems and ecosystem services to global changes
- Sub-theme II.III: Developing and applying ecological engineering and ecohydrology for ecosystems restoration
- Sub-theme II.IV: Integrating ecosystem services into the management of water resources and aquatic ecosystems

The results of the survey are shown in **Figure III**.



**Figure III.** Preference of workshop theme based on the survey.

Workshop participants were selected based on the suggestions made by Task A.1 partners, as well as identified by the Research Council of Finland through openly available sources (webpages of organisations, initiatives, and research programmes). Participation was by invitation only. While selecting workshop participants, partners considered a number of criteria e.g. country/ area, gender, areas of expertise, background and level of seniority. Given the budget and the size of the venue, the total number of participants was limited to approximately 45 people, including Water4All partners.

Before the workshop, participants received a Discussion note, the Workshop programme and the List of participants. Additionally, they were encouraged to familiarise themselves with the [Water4All SRIA](#), especially the Theme II, openly available online. The discussion note was used as a working material for the workshop. It included a short introduction to the theme of the workshop, and presented some topical initiatives, reports, events, and questions relevant to discussions (e.g., update on 2022 UN Biodiversity Conference COP15 – Kunming -Montreal Global Biodiversity Framework (GBF), The UN 2023 Water Conference and Megatrends).

As regards workshop participants, they represented 16 countries from 36 different organisations, broken



Figure IV. Expert panel discussion.

down as follows: 20 representatives from the Water4All Partnership, 1 Advisory Board member, 2 invited speakers and 24 invited experts. Attendees had a mixed background including academics (55%), funders (approximately, 45%), policymakers and NGOs. The expertise of participants ranged from biodiversity and ecosystem services to environmental law and water resources engineering. Keynote presentations were given by Kate Brauman (Global Water Security Centre, University of Alabama) and Sanna Ahvenharju (University of Turku, Finland’s Futures Research Centre). The full list of attendees is included in **Annex I**.

To achieve the aim of the workshop and enable discussions and knowledge sharing, the workshop was based on several **facilitated break-out sessions**, with designated facilitators and rapporteurs. The programme is provided in **Annex II**.

**Table 1.** Facilitators and rapporteurs of the breakout sessions.

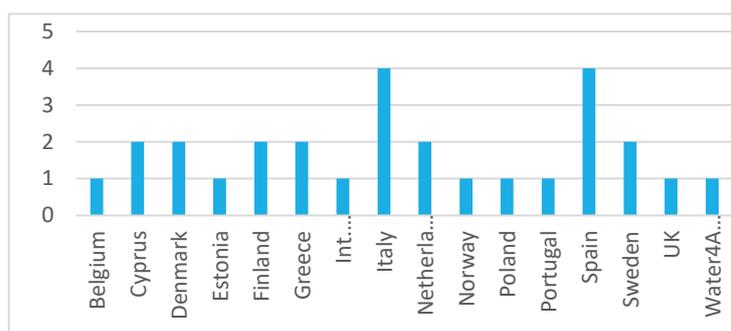
Session	Topic	Room	Group	Facilitator	Rapporteur
Breakout session 1	Sub-theme II.I. Functioning and biodiversity	1	A	Kristina Laurell	Esther Diez Cebollero
Breakout session 1	Sub-Theme II.II Resilience, mitigation and adaptation of aquatic ecosystems and ecosystem services to global changes	2	B	Miguel Angel Gillarranz	Kor Van Hoof
Breakout session 1	Sub-theme II.III Developing and applying ecological engineering and ecohydrology for ecosystems restoration	3	C	Felix Frances Garcia	Klaus Hinsby
Breakout session 1	Sub-theme II.IV Integrating ecosystem services into the management of water resources and aquatic ecosystems	3	D	Andrea Rubini	Helena Alegre
Breakout session 2	Drivers, enablers and barriers	1	A	Henrik Dissing	Helena Alegre
Breakout session 2	Impacts	2	B	Ana Isabel Da Silva Mendes	Dominique Darmendrail
Breakout session 2	Cross-cutting & policy implications	3	C	Ariane Blum	Maciej Zalewski
Breakout session 3	Megatrends	2	B	Kor Van Hoof	Kristina Laurell
Breakout session 3	Future risks	3	C	Seppo Hellsten	Seppo Hellsten

A number of presentations were made to introduce the topics of discussion. The last part of the workshop included an Expert Panel session on how to implement the knowledge gaps identified by participants in the upcoming SRIA, and possible synergies between Water4All and other initiatives. The panel consisted of Kate Brauman (Global Water Security Center, Univ. Alabama), Christine Colvin (WWF International), Andrea Rubini (Water Europe), and Magnus Tannerfeldt (Biodiversa+). The panel discussion (Figure 3) was chaired by Miguel Gilarranz (Water4All Vice-Chair). The workshop was concluded with closing words by Bjørn Kaare Jensen (Water4All Chair) and Ariane Blum (Water4All CEO).

## SECOND STAKEHOLDER CONSULTATIVE WORKSHOP, June 2024

The second stakeholder consultative workshop was organised by the French National Research Agency, ANR, with the logistical support from LNEC. The preparation of the workshop started almost one year before with the identification of the topic of discussion. It was then decided to focus discussions on **“the digital revolution and digital tools”** as it is an area of increasing importance in water management and digital tools can support activities across all the scientific domains covered in the SRIA. By digital tools, it is meant a wide range of technologies and systems including smart water meters, remote sensing, Geographical Information Systems (GIS), Internet of Things (IoT), Machine Learning, Cloud Computing platforms and mobile applications that aim to improve data collection, analysis and decision-making processes.

Pillar A partners were invited to propose attendees. It was also decided to include in the list of participants both scientific experts and end-users of digital tools such as water management authorities, associations or water utilities. While selecting workshop participants, partners tried to consider a number of criteria (as done for the workshop in Helsinki one year earlier). **28 experts from 15 countries** and an international organisation finally participated in the workshop as well as 14 representatives from Water4All. The list of participants is attached in **Annex I. Figure V** shows the number of participants per country. One attendee came from ICPDR (International Commission for the Protection of the Danube River).



**Figure V.** Number of participants per country.

Attendees came from different types of organisations. Academics represented the largest share (64%), followed by policy-making/ management authorities (14%), the private sector (11%), water utilities (7%) and NGOs (3%).

Prior to the workshop, all participants received a “Concept note” that outlined the objectives of the workshop, expected results and the workshop programme. They also received a link to the Water4All’s SRIA and a few additional sources of information on digital tools and potential applications in the water sector. The programme of the workshop is available in **Annex II**. It included two plenary sessions and two breakout discussion sessions. Three break-out groups were set up to facilitate some of the discussions. A few days before the workshop, attendees were asked to indicate in which one of the following breakout groups they wanted to be included<sup>1</sup>:

- **Break-out group 1:** Advanced solutions for a circular economy.
- **Break-out group 2:** Integrated water management (surface and groundwater) and water conflicts as a result of the water allocation for different uses.
- **Break-out group 3:** Drinking water (monitoring, treatment and distribution) and water pollution.

Breaking into different groups allowed exploring differences in the use and trends of digital tools for different water domains. As with the workshop in Helsinki, a number of introductory presentations to each one of the breakout sessions were made. The full programme of the workshop is also included in **Annex II**.

**Table 2.** Facilitators and rapporteurs of the breakout sessions.

Session	Topic	Facilitator	Rapporteur
<b>Breakout group 1</b>	Exploring the applications of digital tools in water management	Miguel Angel Gilarranz	Laura Forsström
<b>Breakout group 2</b>	Exploring the applications of digital tools in water management	Ariane Blum	Esther Díez Cebollero
<b>Breakout group 3</b>	Exploring the applications of digital tools in water management	Osman Tikansak	Burcu Yazici
<b>Breakout group 1</b>	Data foundation and data management	Henrik Dissing	Maria Chiara Sole
<b>Breakout group 2</b>	Data foundation and data management	Ana Mendes	Pedro Salgueiro
<b>Breakout group 3</b>	Data foundation and data management	Bjorn Kaare Jensen	Vesa Yli-Pelkonen
<b>Plenary session</b>	How to contribute to full-scale digitalisation	Miguel Angel Gilarranz	-----

<sup>1</sup> A break-out group on aquatic ecosystems and biodiversity was proposed but none of the participants expressed interest to join it.

## KEY OUTPUTS OF THE WORKSHOPS

The following pages summarise the main results of both workshops.

### FIRST STAKEHOLDER CONSULTATIVE WORKSHOP, February 2023

#### KNOWLEDGE GAPS IDENTIFIED BY WORKSHOP PARTICIPANTS

Participants to both workshops were asked to list relevant knowledge gaps in the areas of “Biodiversity and Ecosystems” (Theme II of the SRIA) and digital tools for water management, as a cross-cutting issue.

#### **Knowledge gaps related to the sub-theme II.I. Functioning and biodiversity**

Overall, these insights highlight the importance of a holistic approach and the need for innovative thinking in ecosystem management. Specific topics:

- Need for improved monitoring.
- Understanding ecosystem interactions at different scales, also incorporating the human dimension, utilising modeling techniques and considering multiple pressures.
- Redefining ecological status targets.
- Bridging the gap between science and policy. Participants recommended implementing education and demonstration activities, as well as addressing emerging challenges from the EU Nature Restoration Law.

#### **Knowledge gaps related to the sub-theme II. II. Resilience, mitigation and adaptation of aquatic ecosystems and ecosystem services to global changes.**

Discussions highlighted the need for balanced and cohesive approaches to address water and ecosystem challenges. Specific topics:

- Analysing effective tools and solutions, evidence-based targets.
- Stakeholder engagement.
- Governance integration.
- Resilience and resistance.
- Decision support systems.
- Role of groundwater and biodiversity in water systems.

#### **Knowledge gaps related to the sub-theme II. III. Developing and applying ecological engineering and ecohydrology for ecosystems restoration.**

Discussions focused on restoration, the science-policy interface, the value of ecosystem services, and Nature-based Solution (NbS). The complex legal framework and lack of communication, including on the benefits of groundwater, were identified as barriers. Participants also highlighted the need for integration across disciplines and across scales. Specific topics:

- Need for clear goals, indicators, and baselines for restoration efforts.
- Decision support systems.
- Efficient communication and visualisation of ecosystem service values.
- Integration of ecohydrology and socio-economic aspects at different scales.
- Understanding the role of aquatic ecosystems in addressing climate change e.g. wetlands’ contribution to CO2 sequestration.
- Need for improved legislation, restoration planning, and educational aspects.
- Understanding groundwater ecosystem services and their connection to sustainable water management.

#### **Knowledge gaps related to the sub-theme II. IV. Integrating ecosystem services into management of water resources and aquatic ecosystems.**

The group discussed the effective integration of ecosystem services into water resource and aquatic ecosystem management. They recognized the complexity of real problems and the need for focus. Specific cases and fundamental aspects should be addressed, learning from networks of cases. Knowledge gaps persist in the **monitoring of water resources and aquatic ecosystems, valuation of ecosystem services, land-sea interactions, and policy instruments for the integration of ecosystem services.**

Participants advocated for the holistic integration of research, innovation, governance, and market dimensions.

**Figure VI.** A group discussing the current SRIA theme “Integrating ecosystem services into management of water resources and aquatic ecosystems”.



#### **DRIVERS, ENABLERS AND BARRIERS RELATED TO THE SRIA THEME II AND ITS SUB-THEMES**

Discussions highlighted several key drivers, barriers, and enablers related to SRIA Theme II and its sub-themes. **Drivers** included climate change, societal focus on nature, the state of natural systems, the pandemic's impact, urgency to act, and technology availability. **Barriers** included commercialisation challenges, communication gaps, knowledge transfer issues, limited incorporation of non-engineering aspects, space requirements, and time considerations. **Enablers** included digital transformation, advanced remote sensing technologies, education, stakeholder collaboration, decision-support tools, and effective communication. Research gaps were identified in enhancing NbS processes, scaling up, governance and regulation, communication, and benefit assessment. Recommendations emphasised engaging relevant stakeholders, citizen science, interdisciplinary approaches, data sharing, citizen involvement, and the establishment of Water-oriented Living Labs. Governance, communication, and information were recognized as critical aspects throughout the discussions.

On this basis, workshop participants discussed possible recommendations for Water4All to achieve expected impacts (i.e. “to preserve and restore ecosystems so that they deliver better their services”) and accelerate progress towards the SDG targets. The following suggestions were made: To **strengthen interlinks between stakeholders, to invest in multi-disciplinary research, to involve SMEs, to promote sustainable solutions through co-construction, and co-design impact-oriented actions.** Developing **FAIR** (Findable, Accessible, Interoperable and Reusable) **data platforms, focusing on communication and knowledge transfer, and acknowledging multiple contributors** were also mentioned as vital to support decision-making. To accelerate progress towards SDG targets, participated suggested fostering interlinks, developing a long-term vision, investing in **education, updating international conventions, and supporting the establishment of a comprehensive framework on water challenges akin to the IPCC.**

## FUTURE PERSPECTIVES - MEGATRENDS

During this last session of the workshop, participants debated about the kind of positive or negative changes are expected to aquatic ecosystems, biodiversity, and ecosystem services as a result of megatrends, as well as the transformative changes required to secure aquatic ecosystems and their biodiversity, and possible future opportunities related to aquatic ecosystems.

In conclusion, emerging risks from geopolitical situations and social security imbalances, coupled with natural climate risks like extreme drought, pose challenges to restoration and research funding. The SRIA needs to be flexible and responsive to crises by addressing issues such as chemicalisation, overuse of water resources, or slow political implementation. Clear results and impacts communication, involvement of financing organizations, proper storage/dissemination/reuse of research results and data, stakeholder mapping, and addressing the three key risk categories of money, space, and silos are essential for effective risk mitigation. Clarifying the role of the partnership Water4All and incorporating social research and collaboration in future calls were recommended.

## SECOND STAKEHOLDER CONSULTATIVE WORKSHOP, June 2024

### EXPLORING THE APPLICATIONS OF DIGITAL TOOLS IN WATER MANAGEMENT: DRIVERS, BARRIERS AND TRENDS IN THE USE OF DIGITAL TOOLS

**DRIVERS IDENTIFIED BY PARTICIPANTS:** **Climate change**, including extreme events and particularly water scarcity, was mentioned as a **major driver** for the use of digital tools. Other drivers mentioned include European legislation, urbanisation, aging infrastructure, and water quality monitoring requirements.

Through these tools, it is possible to tease out more holistic and precise resource balance analyses and accounting, leading to a more optimal use of water. Generative AI can develop better and more ambitious models for quicker decisions. Moreover, digital tools can help to comply with water and resource transparency principles, whilst also supporting the risk-based approach (health and environment). Digital tools can also aid in better assessing impacts, tracking the status and fate of contaminants, and in enhancing evidence-based decision-making and public acceptance towards certain approaches and processes e.g. use of reclaimed water. Digital tools provide a better comprehension of complex systems through the production and analysis of a large quantity of information.

To be fully implementable, digital tools must be flexible, affordable and efficient. Still, drivers for the deployment of digital tools differ between the private sector and public entities. Whereas the roll-out of digital tools for the private sector relies on possible economic benefits/ convenience, the use of digital tools in the public sector is mainly driven by their capacity to improve and simplify the decision-making process.

#### **BARRIERS:**

- There are multiple solutions in the market, some of them very specific, being therefore very difficult for water utilities and managers to select best available tools. In this context, there is a tendency to use more traditional tools that have proved useful in the short term.
- It is necessary to improve cost-efficiency.
- Insufficient experience and/ or capacity to understand and adopt digital tools, especially in small utilities. In this regard, there is a need for simpler standardised solutions. In some cases, users do not trust solution providers, being then necessary to improve communication on the benefits of digital tools from the beginning of projects. The use of MOOCs and citizen science platforms could help solve this problem.
- Lack of funding/ investment to support digitalisation.

- Need for new organisational paradigms. This seems to be particularly the case of water utilities.
- Data sharing is not always optimal because of the existence of sensible data e.g. water infrastructure.
- Whereas the contribution of digital tools in tracking contamination and assessing impacts is clear, it is not fully understood how digital tools can help to identify and create value chains. Benefits are not evident or quantifiable at first.
- Digitalisation projects are short-term and too small to be efficient.
- Lack of standardisation. Numerous inputs are made available but the absence of standards impedes from comparing data.
- Data ownership/ sovereignty, which may lead to disagreements between tool providers.
- Data security.
- Weak or absent internet connection.
- Policies are not supportive enough of digitalisation.

**TRENDS IN THE DEVELOPMENT OF DIGITAL TOOLS.** Evidence seems to show preference for machine learning, explainable AI, web-based services, digital twins, IoT, augmented reality and remote sensing. Participants highlighted the need to combine different data collection methods and technologies (e.g. remote sensing, AI, blockchain, machine learning, citizen science) to achieve higher potential and deliver more reliable results quickly. Integrated tools must be flexible, simple and open access.

Participants also indicated that there are no data spaces for water-related data. A data space for water would allow connecting data, sharing services and creating algorithms to answer existing research questions.



**Figure VII.** A group discussing drivers, existing barriers and trends in the development and use of digital tools in the water sector.

#### DATA FOUNDATION AND DATA MANAGEMENT

As part of the Task C4.3, Water4All will produce by June 2028 a data sharing facility to be eventually transferred to a European Water Data Sharing Infrastructure. This will be done in cooperation with other external organisations and initiatives such as EOSC and AquaInfra. The delivery of the data sharing facility will imply the development of a mock-up for the sharing of data management plans and reports by the end of 2024, the testing of API-based data sharing, and a prototype by 2026 for hydrometric/ quality and surface/ groundwater data from both selected use cases and funded projects via annual calls. In this context, workshop participants discussed three different relevant aspects to the development of the data sharing infrastructure: **Findability and Accessibility of data, Combination and Interoperability of data, and Best practices.**

Discussions revealed that data accuracy, data heterogeneity, fragmentation and data unavailability for certain domains are particularly challenging. Even if data is accessible, it is not always shared. Today, data sharing is not really limited by technicalities but by stringent regulations, the lack of standardisation, the lack of capacity of end-users, and security issues (e.g. water utilities). Data accessibility is particularly problematic at the regional level. The role of remote sensing as a main provider of data was highlighted. The need for the

development of business models to secure the accessibility and use of data i.e. wastewater data was also brought up by participants as a key research need.

It was indicated that technicalities for data combination and interoperability are not well known by all members of an organisation so digital training is needed at all levels. Data interoperability is also constrained by limited data quality, metadata, frequency of data collection, and lack of standardisation. Artificial intelligence could offer opportunities for enhancing data combination and interoperability. On this basis, participants concluded that there is a need to set indicators, standards and baselines for benchmarking. This would allow, for instance, benchmarking and comparing progress towards circular economy. The combination of data is also required for the whole integration of the Water-Energy-Food-Ecosystem nexus data.

Finally, participants came up with a list of best practices for enhancing data management. Participants welcomed Water4All's initiative to foster a water data space, which will enable collaboration between innovators, problem owners and water utilities, as well as cooperation between different domains e.g. agriculture, infrastructure. Water4All should also play a role in supporting access and use of data, creating awareness of the importance of data spaces, and in supporting the implementation of EU Directives – including those on the use of data.

The launch of calls on data sharing and digitalisation was advocated by the group, which also encouraged funded projects to actively communicate on the data generated through research activities.

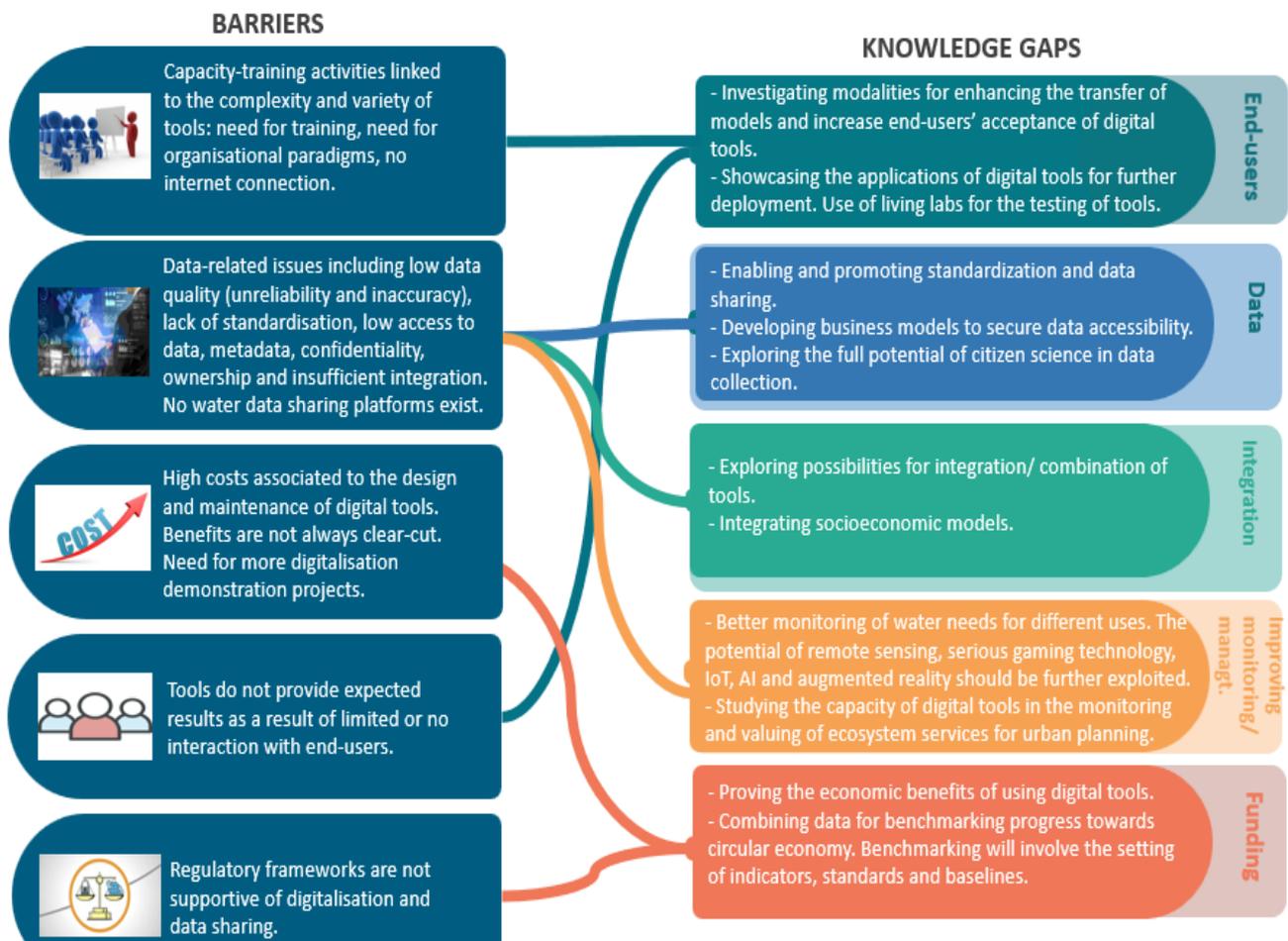
The understanding of digitalisation and the implementation of best practices in water data management is not equal across countries (more advanced in western-European countries). According to participants, Water4All could propose twinning activities for best practices in data management.

## HOW TO CONTRIBUTE TO FULL-SCALE DIGITALISATION

Following an introductory presentation, and in the form of a plenary session, workshop participants were asked to reflect on possible strategies to support digitalisation in the water sector. The following ideas were put forward:

- Providers of digital tools must work with end-users from the early stages of projects in order to satisfy the needs of the latter.
- Supporting researchers through training, especially young generations.
- Developing simple tools.
- Enabling the creation of tools with the support of multidisciplinary tools including both IT experts and civil engineers.
- Showcasing what exists to promote further deployment.
- Using Living Labs for testing digital tools.

In the light of all the discussions, attendees were asked **to translate their views on digitalisation and their potential use in the water sector into specific knowledge gaps** that could be incorporated in the next version of the Water4All's SRIA. The opinions expressed during the workshop are indicated in the right-hand part of the **Figure VIII**. Moreover, each one of those knowledge gaps proposed by workshop participants have been linked to one (or more) the barriers identified in previous sessions. Such barriers are indicated on the left-hand side of the Figure. This work has been done by Pillar A members following the physical meeting in Lisbon and validated by all participants during the review of the associated Proceedings.



**Figure VIII.** Key challenges/ barriers identified by workshop participants for the use of digital tools and associated knowledge gaps.

## CONCLUSIONS AND NEXT STEPS

Since its official launch in June 2022, and as part of the activities for the update of the SRIA, Water4All partners have organised two consultative workshops. This is a crucial milestone for the Water4All programme, particularly in ensuring that the strategic agenda remains relevant, comprehensive and well-aligned with the evolving needs of stakeholders and society in general. Consultative workshops foster inclusive participation, allowing various types of stakeholders – such as researchers, policy makers, water utilities – to share their insights and expectations. By involving a diverse range of voices, the agenda can better reflect the collective needs and aspirations, preventing it from being shaped by a narrow group of interests.

Moreover, consultative workshops provide a platform for identifying emerging trends, new challenges, and opportunities. In rapidly changing fields like water science, what may have been cutting-edge or strategic a few years ago could now be outdated. Consultative workshops encourage dialogue and knowledge sharing, enabling participants to collectively evaluate existing strategies, assess gaps, and consider innovative approaches that should be prioritised in the revised version. Last but not least, these workshops help to build consensus and collaboration. This collaborative environment enhances the legitimacy and buy-in for the updated agenda, increasing the likelihood of its successful implementation.

The first consultative workshop focused on Theme II of the Water4All's "Ecosystems and biodiversity", following the results of the survey sent to partners. The results of this workshop will not only be instrumental in the update of the SRIA but they also proved useful in the framing of topics for the Water4All's 2023 call on ecosystem services. The second workshop concentrated on digital tools, as tools offering wide applications in water management and planning.

## CONCLUSIONS

Both workshops have allowed Water4All partners discriminate different types of knowledge gaps that should be included, or highlighted in the next version of the SRIA. The information provided in previous sections gives a detailed overview of the main results of discussions and, on this basis, it could be concluded that the main **knowledge gaps** persist as regards water ecosystems and biodiversity and digital tools:

- The need for better monitoring of water ecosystems and biodiversity, including the combination of different methodologies/ approaches to enhance monitoring capacities. The potential of IoT, AI or augmented reality should be better seized.
- Better understanding of interactions of ecosystems at different scales, multiple pressures and land-use interactions.
- Integration of ecohydrology and socio-economic aspects at different levels. Bringing together concepts and methodologies from the social sciences may facilitate the integration of ecohydrological approaches in water management/ planning.
- Need for new ecological status targets considering existing challenges and current status of ecosystems and biodiversity. This knowledge gap is of particular interest in the implementation of the EU Restoration Law.
- Developing approaches for benchmarking progress (indicators, targets, baselines) towards restoration targets or circular economy.
- Better understanding the contribution of aquatic ecosystems of climate change e.g. CO<sub>2</sub> sequestration.
- Ecosystem services valuation, including improved communication and visualisation.
- Understanding interactions between groundwater ecosystem services and sustainable water management.
- Enhancing NBS processes, including scaling up, governance and regulation, communication, and benefit assessment.
- Enhancing water data sharing through the creation of a platform.

- Overcoming data fragmentation and heterogeneity (due to the lack of standards).
- Developing business models to secure the accessibility of data.
- Investigating modalities to enhance the transfer of models and increase end-users' acceptance of digital tools.
- Using living labs for showcasing the applications of digital tools as well as their economic benefits.
- Exploring the full potential of citizen science in data collection.

Both workshops also allowed the identification of enablers and barriers for integration in the next SRIA. An enabler is understood as a factor that facilitates progress, supports innovation, and contributes to the successful execution of research goals. A barrier stands for any obstacle that may impede the progress or success of Water4All. The following key enablers and barriers were identified:

**ENABLERS:** Digital transformation, advanced remote sensing technologies, education, stakeholder collaboration, decision-support tools, and effective communication.

**BARRIERS:** Commercialization challenges of proposed Water4All-supported solutions, communication gaps, knowledge transfer issues, limited incorporation of non-engineering aspects, and time considerations.

As regards digital transformation, specific difficulties for their roll-out were teased out by participants during the workshop in Lisbon, namely: Insufficient visibility of their benefits in the water sector, complexity, costs, need for new organisational paradigms, and unsupportive legislation. Data security and data ownership issues may also impede from their wide use.

Other than the knowledge gaps identified by active participants to the workshops, both meetings were useful to gather experts' views as to general pillars of actions that should be carried out, or promoted by Water4All. Whereas many of them are already ongoing, others must be still improved. The following points were raised:

- Strengthening science-policy interface.
- Demonstration.
- Education/ capacity-building/ capacity-development programmes.
- Stakeholder engagement.
- Addressing policy requirements such as the EU Nature Restoration Law.
- Implementation of holistic approaches through the integration of disciplines and scales – the role of social sciences was highlighted in numerous occasions.
- Improved communication to policy-makers and other audiences and knowledge transfer.
- Data sharing through a dedicated platform.
- Supporting to activities of international conventions.
- Promoting citizen science.
- Further involving the private sector, in particular SMEs.

## NEXT STEPS

The outputs of the workshops will drive the update process of the Water4All's SRIA, a second version of which will be published at the end of 2025. The SRIA will not only be an essential document in the framing of future calls for proposals but also in the identification of other additional activities, in particular within Pillars C and D. Thus, exchanges with workshop participants have also allowed drawing some key lessons and good practices to be applied throughout the programme such as the necessity to involve end-users in the definition and implementation of research activities, the need to launch training activities, and the crucial role of communication and dissemination in the showcasing of good examples. The importance of Living Labs was mentioned during discussions, which reinforces the strong willingness of research communities to test innovative solutions in real environments in collaboration with stakeholders.

The organisation of the consultative workshop on the topic of digital tools has also enabled Water4All partners to have a better understanding of running initiatives and programmes in this field. Collaboration with those initiatives will be reinforced.

No more stakeholder consultative workshops at the European level are foreseen by Water4All. However, some countries will hold a national consultative seminar in 2025.

It should be noted that, as part of the second period of Water4All (June 2024-June 2026), Water4All partners will set up five working groups related to the different themes of the SRIA. Each working group will gather up to 7 experts and they will discuss remaining knowledge gaps. A call for experts will be launched towards the end of 2024. A two-day physical meeting will take place at the beginning of April.

All the outputs from these working groups, the consultative workshops, the public consultation, the foresight activity and the literature review will be analysed and integrated in the next SRIA.

## ANNEX I. LISTS OF PARTICIPANTS

### FIRST STAKEHOLDER CONSULTATIVE WORKSHOP, February 2023

<b>NAME</b>	<b>INSTITUTION, COUNTRY</b>
Sanna Ahvenharju	Finland Futures Research Centre (FFRC), Finland
Helena Alegre	LNEC - National Laboratory for Civil Engineering, Portugal
John Anderson	Loughborough University, United Kingdom
Cintia Bertacchi Uvo	Finnish Environment Institute (SYKE), Finland
Rosetta Blackman	University of Zurich/Eawag, Switzerland
Godecke Blecken	Luleå University of Technology, Sweden
Ariane Blum	ANR, France
Núria Bonada	University of Barcelona, Spain
Kate Brauman	Global Water Security Center, Univ. Alabama, USA
Antonio Camacho	University of Valencia, Spain
Christine Colvin	WWF International, United Kingdom
Dominique Darmendrail	BRGM, France
Hendrika de Lange	Rijkswaterstaat, The Netherlands
Lisette de Senerpont Domis	NIOO-KNAW, The Netherlands
Esther Diez Cebollero	ANR, France
Henrik Dissing	Miljøstyrelsen - Danish EPA, Denmark
Isabelle Durance	Cardiff University, United Kingdom
Laura Forsström	Academy of Finland, Finland
Felix Frances	PTEA, Spain
Miguel A. Gilarranz	AEI, Spain
Paul Giller	University College Cork, Ireland
Hans-Peter Grossart	IGB Leibniz, Germany
Klaus Hinsby	GEUS, Denmark
Bjørn Kaare Jensen	Water4All, Denmark
Krista Koppelomäki	Academy of Finland, Finland
Jussi Kukkonen	University of Eastern Finland, Finland

<b>NAME</b>	<b>INSTITUTION, COUNTRY</b>
Manuel Lago	Ecologic Institute, Germany
Florian Leese	Univ. Duisburg-Essen / Water Science Alliance, Germany
Kristina Laurell	Formas, Sweden
Patrick Meire	University of Antwerp, Belgium
Ana Mendes	University of Évora, Portugal
Anna Norström	Svenskt Vatten, Sweden
Peeter Nõges	Estonian University of Life Sciences, Estonia
Tiina Nõges	Estonian University of Life Sciences, Estonia
Tomasz Okruszko	Warsaw University of Life Science, Poland
Marco Petitta	Sapienza, Italy
Antti Rautavaara	Ministry for Foreign Affairs of Finland, Finland
Andrea Rubini	Water Europe, Belgium
Jari Silander	Finnish Environment Institute (SYKE), Finland
Niko Soininen	University of Eastern Finland, Finland
Konstantinos Stefanidis	University of Patras, Greece
Magnus Tannerfeldt	Biodiversa+ and Formas, Sweden
Kor Van Hoof	VMM, Belgium
Vesa Yli-Pelkonen	Academy of Finland, Finland
Maciej Zalewski	European Regional Centre for Ecohydrology PAS, Poland

## SECOND STAKEHOLDER CONSULTATIVE WORKSHOP, June 2024

<b>NAME</b>	<b>INSTITUTION, COUNTRY</b>
Helena Alegre	LNEC, Portugal
Mona Arnold	VTT, Finland
Ariane Blum	ANR, France
Esther Díez Cebollero	ANR, France
Henrik Dissing	MST, Denmark
Alfonso Expósito García	University of Málaga, Spain
Francesco Fatone	University of Marche, Italy
Staffan Filipsson	Svensk Vatten, Sweden
Laura Förstrom	AKA, Finland
Helen Galfi	IVL, Sweden
Marta Galliani	Po River District Basin Authority, Italy
Miguel Angel Gilarranz	AEI, Spain
Bjorn Kaare Jensen	GEUS, Denmark
Matina Katsiapi	EYATH, Greece
Virginie Keller	CEH, United Kingdom
Tiit Kutser	University of Tartu, Estonia
Evripides Kyriakides	Water Development Department, Cyprus
Vittoria Laterza	ISPRA, Italy
Agnethe Nedergaard Pedersen	VandCenterSyd, Denmark
Ryle Nørskov Gejl	MST, Denmark
Zoran Major	ICPDR
Ioannis Manakos	Centre for Research and Technology Hellas, Greece
Ana Mendes	University of Evora, Portugal
Michael Miazga	RECPOLSKA, Poland
Brunella Morandi	University of Bologna, Italy
Luisa Prista	Freelance consultant, Belgium
Harsha Ratnaweera	Norwegian University of Life Sciences, Norway

<b>NAME</b>	<b>INSTITUTION, COUNTRY</b>
Ana Rilo	LNEC, Portugal
Pedro Salgueiro	University of Evora, Portugal
Miquel Sarrias Montón	CETAQUA, Spain
Dragan Savic	KWR Water, The Netherlands
Juan Sobreira Seoane	ITG, Spain
Maria Chiara Sole	ISPRA, Italy
Gaëtane Suzenet	International Impact Partners, France & Water4All's Advisory Board
Sérgio Teixeira Coelho	Baseform, Portugal
Osman Tikansak	FORMAS, Sweden
Cintia Uvo	SYKE, Finland
Lydia Vamvakeridou-Lyroudia	KWR Water, The Netherlands
Eloisa Vargiu	CETAQUA, Spain
Stelios Vrachimis	KIOS, University of Cyprus, Cyprus
Burcu Yazici	SUEN, Turkey
Vesa Yli-Pelkonen	AKA, Finland
Selena Ziccardi	Po River District Basin Authority, Italy

## ANNEX II. PROGRAMMES OF THE WORKSHOPS

### FIRST STAKEHOLDER CONSULTATIVE WORKSHOP, February 2023

#### PROGRAMME

#### Thursday 16<sup>th</sup> February 2023

09:30-10:00 Registration and coffee (location TBC)

10:00 – 12:00	<p>Welcome (10 min)</p> <p>Introduction to Water4All and SRIA process and aims (25 min)</p> <p>Presentation: <b>“Water - Game Changer for enhancement of SDG”</b> (10 min)</p> <p>Keynote presentation: <b>“The value of water, information, and nature-based solutions for achieving water security”</b> (45 min+ 15 min)</p> <p>Quick intro to breakout sessions (10 min)</p>	<p>Opening words Bjørn Kaare Jensen, Water4All Chair Ariane Blum, Water4All CEO Esther Diez Cebollero, ANR</p> <p>Maciej Zalewski, Water4All Vice-Chair</p> <p>Kate Brauman, Global Water Security Center, University of Alabama</p> <p>Laura Forsström/Vesa Yli-Pelkonen</p>
<b>12:00 – 13:00 Lunch at the hotel restaurant</b>		
13:00 – 14:45	<p>Breakout session 1: Content of the SRIA Theme II</p> <ul style="list-style-type: none"> <li>▪ Room 1: Sub-theme II.I Functioning and biodiversity</li> <li>▪ Room 2: Sub-theme II.II Resilience, mitigation and adaptation...</li> <li>▪ Room 3: Sub-themes II.III Developing and applying ecological engineering...&amp; II.IV Ecosystem restoration and ecosystem services</li> </ul>	3 rooms, 4 groups
<b>14:45-15:15 Coffee break</b>		
15:15-16:45	<p>Breakout session 2: We know the problems, what are the solutions?</p> <ul style="list-style-type: none"> <li>• Room 1: Drivers, enablers and barriers</li> <li>• Room 2: Expected impacts</li> <li>• Room 3: Cross-cutting themes and policy implications</li> </ul>	3 rooms, 3 groups
16:45-18:00	Wrap-up of day 1	Facilitators/Rapporteurs
19:00 – 22:00	Climate Friendly Dinner at Bistro Gimis (Hotel restaurant)	

#### Friday 17<sup>th</sup> February 2023

09:00 – 09:45	Keynote presentation: <b>“Future thinking and wicked problems”</b>	Sanna Ahvenharju, University of Turku, Finland Futures Research Centre
09:45 – 11:30	<p>Breakout session 3: Future perspectives</p> <ul style="list-style-type: none"> <li>• Room 1: Review paper kick off</li> </ul>	3 rooms, 3 groups Room 1 facilitated by SYKE

	<ul style="list-style-type: none"> <li>• Room 2: Megatrends</li> <li>• Room 3: Future risks</li> </ul>	
11:30-11:50 Coffee break		
11:50 – 13:00	<p>Wrap up of Session 3 (30min)</p> <p>Round table/panel discussion (30 min)</p> <ul style="list-style-type: none"> <li>• How to implement the identified RDI needs in the area of Theme II. Water for ecosystems and biodiversity?</li> <li>• What is the policy relevance of the identified topics?</li> <li>• What are the synergies with other initiatives/Water4All Pillars?</li> </ul> <p>Closing words &amp; Next steps (10 min)</p>	<p>Facilitators/Rapporteurs</p> <p>Participants: Kate Brauman, Global Water Security Center; Christine Colvin, WWF International; Andrea Rubini, Water Europe; Magnus Tannerfeldt, Biodiversa+</p> <p>Chair: Miguel Gilarranz, Water4All Vice-Chair</p> <p>Closing words: Bjørn Kaare Jensen, Water4All Chair &amp; Ariane Blum, Water4All CEO</p>

**13:00 END OF THE WORKSHOP**

## SECOND STAKEHOLDER CONSULTATIVE WORKSHOP, June 2024

### PROGRAMME

<b>Monday 3<sup>rd</sup> June, from 9.00 to 17.30</b>		
9.00-9.30	<b>Arrival</b> of participants and registration	
9.30 – 10.00	<b>Introduction to the workshop and the Water4All Partnership:</b> Welcome address and introduction to the objectives of the workshop. Presentation of the Water4All Partnership. Water4All's strategic agenda.	<b>Ariane Blum</b> , Water4All CEO and <b>Esther Díez</b> , Water4All's Pillar A Coordinator
10.00-10.15	<b>The use and usefulness of digital tools in water management. Trends and directions.</b>	<b>Helena Alegre</b> , LNEC and Water4All partner
<b>10.15-12.45– PART I: Exploring the applications of digital tools in water management</b>		
10.15-10.45	<b>Looking into some examples of the use of digital tools in water resource management.</b> How are digital tools used currently? A perspective from a research-driven initiative and an end-user.	<b>Cintia Uvo</b> , SYKE (Finland) <b>Agnethe Nedergaard Pedersen</b> , VandCenter Syd (Denmark)
<b>10.45-11.00 - Coffee break (15')</b>		
11.00-12.15	<b>Break-out discussions.</b>	
<b>PLENARY SESSION</b>		
12.15-12.45	<b>Drawing out conclusions from break-out discussions. Q&amp;A from the audience.</b>	<b>Presentation from rapporteurs.</b>
<b>12.45-14.00 - Lunch Break (1h15')</b>		
<b>14.00-16.30 – PART II: Data foundation and data management</b>		
14.00-14.30	<b>Setting the ground for a data-driven strategy in water management.</b> Teasing out specific activities for Water4All.	<b>Henrik Dissing</b> , Miljøportal (Denmark) <b>Brunella Morandi</b> , University of Bologna (Italy)
14.30-15.45	<b>Break-out discussions.</b>	
<b>15.45-16.00 – Coffee break (15')</b>		
<b>PLENARY SESSION</b>		
16.00-16.30	<b>Drawing out conclusions from break-out discussions. Q&amp;A from the audience.</b>	<b>Presentation from rapporteurs.</b>
16.30-16.40	Recap of discussions and closure of the first day	<b>Miguel Angel Gilarranz</b> , Water4All vice-Chair OR <b>Ariane Blum</b> , Water4All CEO
<b>16.40-17.30: NETWORKING EVENT</b>		

<b>Tuesday 4<sup>th</sup> June, from 9.00 to 16.30</b>		
9.00-9.30	<b>Arrival</b> of participants and registration	
9.30 – 12.30	<b>Opening ceremony and keynote lectures.</b> Challenges in coastal climate change adaptation. River bars and meanders - from the lab to the real world by Ana Maria da Silva	<b>Íñigo J. Losada</b> , University of Cantabria (Spain) <b>Ana Maria da Silva</b> , Queen's University (Canada)
<b>12.30-13.30 - Lunch break (15')</b>		
<b>13.30-16.30 – PART III: How to contribute to full-scale digitalisation</b>		
13.30-14.00	<b>The implications of digitalisation for research, innovation and policy-making.</b> Building upon past experiences and offering new perspectives for the future.	<b>Harsha Ratnaweera</b> , EWA and Norwegian University of Life Sciences (Norway)
14.00-15.00	<b>Break-out discussions.</b>	
<b>15.00-15.30 – Coffee break (15')</b>		
<b>PLENARY SESSION</b>		
15.30 – 16.00	<b>Drawing out conclusions from break-out discussions. Q&amp;A from the audience.</b>	<b>Presentation from rapporteurs.</b>
16.00 – 16.30	<b>Final remarks from the workshop and next steps.</b>	<b>Henrik Dissing</b> , Miljoeportal and Water4All partner <b>Esther Díez</b> , Water4All's Pillar A Coordinator



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