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Shaping a Water Smart Future

Connecting European Regions for Sustainable Water Innovation

Water Quality & Pollution Management

The Water-Food Nexus

Climate Change Adaptation

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Executive Summary

The Water Smart Connect project takes place at a time when there is pressure on water resources in Europe, due to factors such as climate change, the intensification of extreme events (drought, flooding), and greater demand for water in the agricultural, industrial, and urban sectors. Faced with these challenges, it has become essential to adopt integrated, territorialized, and innovative approaches to more sustainable water management. Towards this end, Water Smart Connect aims to strengthen synergies within and between regional innovation ecosystems around smart water management.

The second part of this document presents the European Union's political and regulatory framework for water management, which can serve as a common basis for the deployment of practices and projects.

The project's methodology is based on a collaborative dynamic. The project identified key stakeholders in the seven European regions involved, conducted targeted sessions, and organized both regional and cross-regional workshops. This work helped identify common challenges and structure dialogue around shared objectives.

Three key challenges have emerged: water quality, adaptation to climate change and the food-water nexus. Each of these themes provides opportunities for innovation aligned with the specific needs of the regions and the capacities of their innovation ecosystems and stakeholders.

Finally, a three-year strategic plan has been drawn up to solidify collaboration between the partner regions, and to extend the impact of the project to other European territories. This plan proposes concrete actions to structure a sustainable network, strengthen the diversity of the actors involved, and support the emergence of intelligent and innovative solutions adapted to regional and European challenges.

I. Setting the Scene for a Water-Smart Europe

1. Contextual background: the changing climate in the European Union

In the context of general climate change, Europe faces great pressure on its water resources. This situation brings up various challenges for European regions such as abnormal flooding or droughts in addition to the emergence of new pollutants leading to a deterioration in the quality of water and aquatic environments.

In 2024, Europe faced the warmest year on record and experienced extreme floods, heatwaves, and important wildfires and glacial melting[1]. This same year was also one of the wettest due to rainfalls and floodings which affected more than 400 000 people[2] and

[1] https://climate.copernicus.eu/global-climate-highlights-2024
[2] https://wmo.int/news/media-centre/european-state-of-climate-extreme-events-warmest-year-record

30% of the European river network[3]. According to European Commission, Europe was the fastest-warming continent in 2024[4].

The consequences are not only human, but also economic: extreme events lead to billions of euros in damages[5].

Beyond the effects of climate change, the evolution of human practices (i.e. industrialisation, agricultural production) have led to consequential pressure on water resources and now require European water resilience actions [6] to combat several challenges such as :

- Water quantity : improving water efficiency and water reuse
- Water quality : reducing pollution and improving the knowledge of emerging pollutants
- Sustainable feeding systems
- Knowledge and forecast of extreme events

2. Key EU legislative initiatives shaping the landscape

Facing these challenges, the European Union has made sustainable water management one of its key challenges by adopting several policies directly targeting water and related sectors.

Legislation initiatives for water

➢ The Water Framework Directive

The Water Framework Firective was set up in 2000 to assure water protection in Europe. Different environmental goals have been set at various dates, the next one is in 2027[7].

➢ The Groundwater Directive

Published in 2006, this directive aims to specifically protect the quality of groundwater. Its sets quality standards to limit pollutants presence in water.[8]

➢ The Urban Waste Water Treatment Directive

In 2025, the Euopean Commission revised the Urban Wastewater Treatment Directive to protect water quality and encourage innovation. It extends wastewater collection and

[3] https://news.un.org/fr/story/2025/04/1154751
[4] https://commission.europa.eu/news/2024-warmest-year-record-europe-finds-european-state-climate-report-2025-04-15_en#:~:text=The%20latest%20European%20State%20of,were%20extremely%20hot%20and%20humid
[5] https://www.ecologic.eu/19853
[6] https://www.eea.europa.eu/en/analysis/publications/europes-state-of-water-2024
[7] https://environment.ec.europa.eu/topics/water/water-framework-directive_en
[8] https://eur-lex.europa.eu/eli/dir/2006/118/oj

treatment zones and focuses on micropollutant treatment performance and wastewater treatment plants' energy efficiency[9].

- The Environmental Quality Standards Directive

This directive aims to protect aquatic ecosystems by limiting pollution from harmful substances in surface waters by establishing Environmental Quality Standards for priority substances and pollutants[10].

- The Water Reuse Regulation

The EU Regulation on Minimum Requirements for Water Reuse promotes the safe use of treated urban wastewater for agricultural irrigation. It sets minimum quality standards, risks management obligations, and monitoring requirements to protect health and the environment.[11]

- Assessment and Management of Flood Risks Directive

Published in 2007, this directive provides the possibility to identify and assess all areas where flooding could take place.[12]

- Drinking Water Directive

This directive has been recast in 2020. It aims to improve access to water in the European Union and takes into account tackling pollutants, microplastics, and endocrine disruptors in drinking water quality standards.[13]

<u>Legislation initiatives related to water</u>

- Circular Economy Action Plan

Published in 2020, one of the aims of the action plan is to reduce pressure on natural resources by employing a circular economy approach. It concerns production and consumption systems, including waste and resource sustainability. One of the main objectives focuses on the water sector.[14]

- European Water Resilience Strategy

[9] https://environment.ec.europa.eu/topics/water/urban-wastewater_en
[10] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32008L0105
[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=legissum:4460847
[12] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32007L0060
[13] https://environment.ec.europa.eu/topics/water/drinking-water_en
[14] https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en

Due to the pressure on the water sector, this strategy "will develop a comprehensive multi-annual cross-sectoral plan with milestones in 2030 or 2040".[15] The aim is to lead to a more sustainable and resilient use of water resources and to develop a circular economy approach to the water sector while encouraging innovative actions.

A call for evidence has been published at the beginning of the year 2025 and the strategy is planned for the second quarter of the same year.

In this context, the Water Smart Connect project aims to leverage existing industries, value chains, and ecosystems. The initiative aims to identify regional priority areas that support cross-regional actions, driving the development of a water-smart society.

II. Methodology

As part of Water Smart Connect, several collaborative reflection mechanisms were implemented at both regional and interregional levels. These initiatives aimed to facilitate deeper collaboration and foster collective intelligence, enabling the identification of shared priority issues across different territories and stakeholders.

1. Overview of the process

The project unites seven European regions with different characteristics (i.e. innovation score, GDP-base development level) united by interest in and commitment to furthering a water-smart society. Different actions have been carried out to identify their main challenges related to water based on their innovation strategies and priorities.

This approach allowed the consortium to map water challenges specific to each region, to identify key stakeholders among companies, research centers, educational institutions, and regional and local public authorities.

These initiatives have built the foundations for concrete cross-regional cooperation, aimed at sharing knowledge, identifying synergies, and initiating collaborative dynamics.

2. Stakeholder mapping

[15] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14491-European-Water-Resilience-Strategy_en

All six project partners identified key regional stakeholders defined by the quadruple helix model, which brings together representatives from public authorities, industry, academia, and civil society. At the outset, each region also defined four priority areas aligned with their respective S3 Smart Specialization Strategy.

To assess the continued relevance of these priority areas, each region conducted Entrepreneurial Discovery Workshops (EDWs) and/or interviews. These sessions provided valuable insights into regional challenges and opportunities, helping to identify transformative activities and guide strategic regional development.

As part of the S3 methodology, stakeholders were asked to address key topics such as:

- Regional water-related challenges in both the water sector and cross-sectoral contexts
- Identification of local challenge owners interested in international cooperation
- Innovation capabilities of regional SMEs
- Water-related themes suitable for international collaboration
- Potential EU innovation ecosystems for long-term cooperation

The findings from the EDWs and interviews supplied insights transmissible to the development of regional SWOT analyses and S3 Synergy Diamonds. These tools helped to highlight gaps, regional capabilities, and opportunities for interregional collaboration.

The application of the S3 Innovation Model has played a crucial role in uncovering regional strengths and transformation opportunities, particularly in fostering smart water systems. It has also supported cross-border cooperation and knowledge exchange.

The results emphasize the need for ongoing collaboration, innovation, and shared solutions to address pressing challenges and strengthen regional resilience and competitiveness.

Key priorities that emerged from the stakeholder interviews include:

- Enhancing cross-regional collaboration
- Promoting digitalization
- Emphasizing circular economy principles
- Strengthening climate adaptation strategies
- Supporting research and innovation
- Increasing stakeholder engagement

Building on these insights, the Water Smart Connect consortium partners started scouting for EU funding opportunities aligned with the identified topics as ways to harness competencies and solve challenges. This led to the establishment of several working groups aimed at exploring cross-regional opportunities for collaboration, including expanding the reach further than the original consortium.

3. Regional-level stakeholder sessions

The key stakeholders identified in the mapping phase were involved in interviews and workshops at a regional level based on the main challenges for the partner regions. The objectives of these consultation activities were:

- To identify main strategic and priority areas of innovation for each region,
- To identify place-based transformative activities for water that have European development potential,
- To identify strengths, weaknesses, opportunities, and threats in each of the partner regions.

The analysis of the outcomes of regional workshops and interviews revealed six main topics common to all regions:

- Water reclamation and reuse, circular economy and resource recovery,
- Water quality and pollutants prevention & management,
- Climate change adaptation,
- Digitalization and smart water management,
- Water and food system nexus,
- Cross-sectoral collaboration, policy and governance.

4. Development of cross-regional actions

The six main topics represent economic, environmental and social development opportunities for the regions involved in the project.

A workshop for the cross-regional working group representatives was organized to establish a dialog platform and develop the collaboration reflection with the stakeholders. The workshop included a webinar and matchmaking between quadruple helix stakeholders, incorporating companies, research and educational institutions, public authorities, and civil society actors. This event represented a key milestone in building a shared vision around water-related challenges. During the workshop, the main topics previously identified at a regional level were presented and discussed collectively.

The aims of the cross-regional workshop were:

- To confirm the common interest for the topics,
- To bring the topics to a European level,
- To collect the main concepts, keywords, and ideas associated.

The participants created a foundation to continue working towards common future joint actions.

III. Key Challenges and Topics Identified

1. Water Quality & Pollutant Management/Prevention

Micropollutants such as pharmaceuticals, micropollutants, PFAS, pesticides, and industrial byproducts are increasingly detected in surface and groundwater systems across the 7 project regions. These substances, even at low concentrations, can pose serious threats to aquatic ecosystems and human health. Conventional wastewater treatment facilities often lack the technology to fully remove these compounds, resulting in their accumulation and persistence in the environment.

Challenges identified:

- Insufficient treatment capacity for trace contaminants,
- Lack of regulations targeting emerging pollutants at the source,
- Limited public awareness of pollution from household products and pharmaceuticals.

2. Climate Change Adaptation

In this context, the topic of the climate change adaptation has been identified as one of the priority challenges shared by the 7 regions. Territories have to adapt to concrete changes and extreme events such as floods, drought, pressure on water resources and deterioration of water quality.

The project has identified 3 main lines of action and proposed a roadmap to support these transitions.

Challenges identified

- Water management : water scarcity, excess (causing floods and issue in stormwater management) and initiate a more sustainable use of water resources,
- Enhancing region's resilience,
- Water quality and agri-food safety.

3. The Water–Food Nexus

The process followed in the 7 regions has identified competences that can contribute to improving the agricultural and agrifood industry processes:

Competences						
Pohjois-Savo Finland	Catalonia Spain	Sjæland Denmark	Centre-Val de Loire France	Occitanie France	Fryslân The Netherlands	Aragón Spain
Expertise in agriculture, water treatment, robotics, and online monitoring systems.	Expertise in water circularity, reuse, and integration of the water-energy-food nexus.	Global leadership in water technology, digitization, and climate adaptation	Renowned expertise in geosciences, natural resources, and micropollutant reduction.	Specialized in climate change adaptation and representing areas impacted by global change.	Rich water knowledge legacy and experience in managing water scarcity and nutrient use.	Alignment with EU strategic sectors such as agri-food, data centers, renewable energies, and pharmaceuticals.

Moreover, 30% of the Transformative Activities (TAs) identified in the regional processes are related to agriculture and the agrifood industry, or the development of technologies (elimination of pollutants, monitoring, digitization) that can be applied in the food systems:

From Pohjois-Savo - Finland:

1. Recycling and re-use of (waste) water from municipalities and rural areas (agriculture)
2. Smart water management in agriculture and forestry

Region Sjælland, Denmark:

3. Identify new applications for drone technology in monitoring and managing environmental issues
4. Focus on addressing PFAS contamination and other emerging pollutants. Collaborate with municipalities and companies to develop effective mitigation strategies. In addition to this new methods/technologies to clean PFAS from water
5. Investigate the migration of chemicals from fields into groundwater and drinking water systems. Assess the impact of these chemicals on water quality and public health

Region Fryslân, Netherlands:

6. Wastewater is an important source of finite and scarce (micro)nutrients. For example nitrogen, phosphorus, potassium, zinc, iron and copper. These nutrients have value and their reuse is an important step in closing the nutrient cycle and thus for the Frisian circular economy and self-sufficiency of the region.

Region Centre-Val de Loire and Occitanie, France:

7. Water REUSE: development of technologies (for both monitoring and treatment fields) adapted for water reuse not only for industrial fields but also for watering green spaces, flushing toilets, etc.
8. Reduction and treatment of micropollutants in industrial and agricultural activities
9. Online metrology of industrial and agricultural activities for both monitoring of water quality/quantity and emissions reduction
10. Nature based solution for restoration of water and soil damaged resources, for example by phytoremediation
11. Agriculture: adaptation and improvement of agricultural practices (irrigation and ferti-irrigation, crops adapted to drought constraints)
12. Meet public needs: Local supply loops for organic or quality food, development of specific sectors (legumes for example)
13. Data monitoring and treatment: digital tools (sensors, big data, AI) to improve the use and the distribution of water resource across the territory, risks and water quality and quantity monitoring, valorization of remote data for agriculture
14. Predictions: climate knowledges, risks, seasonal forecasts of the resource
15. Water quality: reducing pollution levels in distributed water and in general water sector, treatment and analysis of micropollutants, toxicity monitoring

Region Aragon, Spain:

16. Develop the water strategy in an interdisciplinary way (agriculture, economy, technology, health…), One Health approach, seeking synergies with other policies and strategies.
17. Encourage digital transformation to detect pathogenic micro-organisms in water and develop technologies for their elimination.
18. Promote forest-water management
19. Encourage the development and implementation of specific technologies to reduce/eliminate diffuse pollution
20. Develop precision agriculture and promote digitalization and efficiency in large irrigation systems

Region Catalonia, Spain:

21. Foster water reuse for industrial and agricultural applications

22. Sensors for real-time continuous monitoring of (reclaimed) water quality
23. Digital tools for the optimisation of water treatment processes and technologies

Then, the working group selected the topic "Focus on food systems," which includes precision irrigation, reducing chemicals and runoff, and adaptation to climate change in food systems.

IV. Translating Challenges into Concrete Opportunities

1. Identifying specific opportunities arising from the challenges

Water Quality & Pollutant Management/Prevention

- Monitoring and Prediction/Modeling

Effective management of pollutants begins with comprehensive monitoring and predictive
modeling. Many regions lack real-time monitoring systems and predictive tools that could enable timely action during pollution events, such as stormwater runoff or accidental discharges. Additionally, data gaps and fragmentation hinder coordinated responses across regional and national levels.

Challenges:

- Insufficient spatial and temporal resolution of monitoring systems,
- Lack of integrated platforms for data sharing across regions,
- Limited predictive capabilities for pollution behavior under different climate scenarios.

What's needed :

Schedule	Action	Description	Relevant for
Medium term (6-18 months)	Deployment of sensor-based monitoring systems in strategic locations	Install continuous measurement sensors at sensitive points such as industrial outflows or storm drains, to detect and prevent pollution	Local authorities, engineering consultancy, industrials
Medium term (6-18 months)	Use of AI and digital twins to simulate pollution loads, transport, and accumulation under various climate conditions	Develop intelligent digital models to simulate the behavior of pollutants in aquatic environments, to help anticipate risks	Engineering consultancy, digital sector SMEs, academics, water agencies

Long term (>18 months)	Development of cross-border data platforms	Develop knowledge and information sharing over a wide area by creating a platform enabling open access and real-time alerts for authorities and stakeholders	Regions and local authorities, SMEs, water agencies

- Mixture toxicity and cumulative stress from effluents and stormwaters

In natural environments, pollutants rarely occur in isolation. Instead, ecosystems are exposed to

complex mixtures of substances whose interactive effects can be difficult to predict. Traditional risk assessments focus on individual compounds, leaving major knowledge gaps regarding thecumulative and synergistic impacts of mixtures, especially during high-load events like storms.

Challenges:

- Lack of regulatory frameworks addressing mixture toxicity,
- Poor understanding of long-term ecological effects of low-dose, chronic exposures,
- Limited scientific tools for evaluating cumulative environmental stress.

What's needed:

Schedule	Action	Description	Relevant for
Short term (0-6 months)	Integration of green infrastructure to filter and buffer pollutant spikes in urban runoff	Implementing NBS (e.g., permeable surfaces, bioswales)	Regions and local authorities, SMEs, engineering consultancy
Medium term (6-18 months)	Advancement of multi-compound toxicity models and bioassays that reflect real-world conditions	Improving tools for assessing the combined effects of pollutants in water to develop a better ecotoxicological risk assessment	Research centers, public health agencies
Long term (>18 months)	Introduction of cumulative risk	Update regulatory frameworks to include	Regions and local authorities,

	thresholds in environmental legislation	cumulative risk indicators, to better reflect the impact of multiple pollution sources on aquatic ecosystems and human health	environmental regulation authorities, water agencies, research centers, public health agencies

- PFAS and Micro/Nanoplastics in groundwater resources

PFAS (Per- and Polyfluoroalkyl Substances) and micro/nanoplastics have emerged as a serious
concern for groundwater safety. These persistent and mobile contaminants are difficult to remove and can leach into drinking water sources, particularly in regions with vulnerable aquifers or industrial legacies. Their long-term health impacts — including endocrine disruption and carcinogenicity — make them especially concerning.

Challenges:

- PFAS are resistant to natural degradation and conventional treatment,
- Microplastics are small enough to infiltrate filtration systems and accumulate in aquatic organisms,
- Limited tools for in-situ detection and removal of these contaminants.

What's needed:

Schedule	Action	Description	Relevant for
Short term (0-6 months)	Application of novel remediation technologies	Develop projects to test and deploy innovative processes (e.g., advanced oxidation processes, nanomaterials, ion exchange resins) to eliminate persistent pollutants	Local authorities, SMEs, research centers
Long term (>18 months)	Long-term groundwater monitoring programs that include PFAS and plastic particle metrics	Set up a multi-year monitoring network to track trends and detect health risks	Water agencies, local authorities, public health agencies
Long term (>18 months)	Policy harmonization across the EU to phase out PFAS use in consumer and industrial products	Encourage Europe level exchanges to define consistent regulations	Regions, local authorities, environmental regulation authorities, public health agencies

- Nature-Based Solutions (NBS) to reduce micropollutant pollution

Nature-based solutions represent a cost-effective, climate-resilient alternative to traditional grey infrastructure for water purification. Wetlands, riparian buffers, green roofs, and urban forests can naturally filter pollutants, retain stormwater, and improve biodiversity. However, their role in reducing micropollutants remains underexplored in many regions.

Challenges:

- Lack of empirical data on NbS performance for micropollutants,
- Low uptake in urban development planning and wastewater policy,
- Need for locally adapted solutions considering regional climate, soils, and land us.

What's needed:

Schedule	Action	Description	Relevant for
Short term (0-6 months)	Development of design guidelines and maintenance protocols for practitioners and municipalities	Create technical standards to encourage the development and multiplication of NBS	Engineering consultancy, urbanism services
Medium term (6-18 months)	Pilot projects and living labs to test and refine NbS performance under diverse conditions	Evaluate the effectiveness of NBS in different climatic and geographical contexts, and guide strategies according to the results	Local authorities, engineering consultancy, research centers
Long term (>18 months)	Incentive schemes and policy integration to mainstream NbS into urban and rural water management	Identify or develop incentive schemes (financial one for example)	Regions and local authorities, water agencies

Climate change adaptation

- Water management:

Climate change is accentuating extreme events, with more intense floods and more frequent droughts, putting territories under tension. Different solutions can be considered for a better adaptation to environmental changes.

- *Integrated tools management*

They are suitable for climate change adaptation because they adopt a global and territorial approach for resource management.

- *Prediction models and data sharing*

They allow territories to anticipate extreme events and to coordinate response actions between stakeholders.

Data sharing allows to forecast evolution of water resources and climate risks in real time and acts as a decision-making tool.

- *Nature Based Solutions*

Nature based solutions (NBS) help to limit the impact of climate change on water resources by regulating water flows through absorption, storage and slowing them down. They smooth out periods of drought and improve water quality through natural filtration systems.

- *Smart innovations*

Smart innovations rely on digital, connected or automated technologies to have a more precise and predictive management of water resources.

It could be smart sensors to improve the knowledge of the state of the resource and to better distribute it according to usage.

- *Regional and national climate roadmaps*

The creation of territorial roadmaps would allow to address strategic aims and needs with long term vision of the climate risks and would serve to anchor water management adaptation for the stakeholders.

This solution adapts to different scales and enables customized strategic analysis for each territory.

What's needed :

Schedule	Action	Description	Relevant for
Short term (0-6 months)	Pursue the Climate change adaptation cross-regional working group	Exchanges of case studies of nature-based solutions, intelligent monitoring tools and shared data systems	Regions and local authorities, clusters, water agencies, academics
Medium term (6-18 months)	Deployment of intelligent solutions for monitoring water resources	Implemented a cross-regional experiment using intelligent tools to monitor resource in real time. Share data between pilot areas.	SMEs, regions and local authorities, water agencies
Long term (>18 months)	Creation of a cross-regional climate roadmap	Integrate a long term vision and a common	Regions and local authorities, clusters,

	on sustainable water management	dynamic for adaptation to climate change	water agencies, academics,

- Resilience territory and smart cities:

Climate change combined with increasing urbanization are putting territories at greater risk (heat islands, intense rainfall, flooding and drought). Cities have to become more adaptable, sober and connected.

- *Urban adaptation plan*

Urban adaptation plans are suitable for cities subject to intense rainfall and flooding that wish to work on increasing permeability and stormwater management.

- *Vegetalised cities*

Vegetalised systems in cities can be used to reduce floods and surface run-off, to encourage groundwater recharge and fight against heat islands. This approach is also an opportunity to include citizens in the process of adapting to climate change and improving quality of life.

- *Raising public awareness*

Raising public awareness on the impacts of climate change on water resource is one of the key to encourage water economy, to prevent citizens to climate risks, or to work on the social acceptance of climate change adaptation solutions.

Citizens can be key stakeholders for territories resilience.

- *Communication improved between cities with common challenges*

Regions and cities face similar challenges. Increased sharing of feedback and best practices would help optimize efforts and results, and to produce impact monitoring and evaluation reports.

What's needed :

Schedule	Action	Description	Relevant for
Short term (0-6 months)	Deployment of communication tools for raising public awareness	Representation the impact of climate change on cities and the solutions to be adopted	Regions and local authorities, environmental associations, educational establishments
Medium term (6-18 months)	Deployment of a vegetalised urban cooling system project	Experimentation of a system fighting heat islands	Regions and local authorities, SMEs, clusters
Long term (>18 months)	Creation of a cross-regional network	Implemented a exchanges platform for regions and local authorities to share case studies and best practices	Regions and local authorities

- Water quality and agri-food safety

The rise of extreme climatic events, such as floods and droughts, is increasing the risks for water management, particularly regarding the presence of emerging pollutants. Securing agri-food systems against these threats is all the more essential to guarantee the quality of water used in agriculture and to ensure a reliable food supply.

- *Sustainable agricultural practices*

Sustainable agricultural practices adapted to the soil help strengthen the resilience of farming systems by reducing water consumption, improving the soil's capacity to retain water and limiting pollution.

- *Cross-sector collaboration developed between the agricultural sector and the water sector*

These collaborations would enable to co-construct shared strategies for resource preservation, food security and regional resilience. They would promote integrated management, industrial symbiosis, optimized usage, water reuse, reduced pollution and increase the deployment of innovative solutions.

- *Quality monitoring and enhanced data analysis tools*

Monitoring and analysis tools would enable earlier detection of pollutants or anticipation of changes in the resource.

Data from sensors or satellite observations would provide a global, precise and real-time vision of the state of resources.

What's needed :

Schedule	Action	Description	Relevant for
Short term (0-6 months)	Creation of a cross-regional infographic	Communication support to highlight links between agricultural and water challenges	Water agencies, agricultural agencies
Medium term (6-18 months)	Pursue of the food-water nexus cross-regional working group	Exchanges of case studies and best practices	Regions and local authorities, clusters, water agencies, agricultural agencies, academics
Long term (>18 months)	Deployment of an agricultural and water data sharing platform	Increase the accuracy of water quality monitoring and improve knowledge of water usage	Regions and local authorities, clusters, water agencies, agricultural agencies, SMEs, farm operators

The topic “Focus on food systems” identified 3 main challenges:

- Precision irrigation,
- Reducing chemicals and runoff,
- Adaptation to climate change in food systems.

Some solutions are identified and could be implemented in a near future.

- **Precision irrigation**

Precision irrigation aims to optimize water management, considering the real needs of crops, climatic conditions and soil structure. These practices reduce waste, improve yields and preserve water resources.

What’s needed:

Schedule	Action	Description	Relevant for
Short term (0-6 months)	Install sensors and localized weather monitoring systems	Provide farm operators with real-time data to adjust irrigation to actual crop demand.	Farm operators, SMEs
Medium term (6-18 months)	Integrate decision-support tools into irrigation systems	Enhance digital tools with data to automate or guide practices	Farm operators, SMEs, agricultural agencies
Long term (>18 months)	Large-scale deployment of smart irrigation in vulnerable areas	Target areas highly exposed to water stress, and provide technical and financial support	Regions, local authorities, water agencies, agricultural agencies

- **Reducing chemicals and runoff**

The use of fertilizers and pesticides contributes to the pollution of water resources through runoff and infiltration. Reducing these impacts means modifying agricultural practices to minimize chemical inputs and improve their assimilation by crops.

What’s needed :

Schedule	Action	Description	Relevant for
Medium term (6-18 months)	Develop systems for monitoring input losses	Use remote sensing (satellite, drone) and spatial analysis tools to identify areas of high runoff and adjust practices	Farm operators, SMEs, research centers
Medium term (6-18 months)	Improve buffer strips and vegetated infrastructure	Filter runoff and reduce pollutant loads before they reach aquatics ecosystems	Local authorities, agricultural agencies, water agencies

Long term (>18 months)	Encourage the transition to more sustainable agri-food systems	Gradually integrate new farming practices	Regions, local authorities, agricultural agencies, water agencies

- **Adaptation to Climate Change in Food Systems**

Climate change is causing extreme events that affect agricultural production. Adapting food systems requires innovative solutions.

What's needed:

Schedule	Action	Description	Relevant for
Short term (0-6 months)	Identify agricultural areas most vulnerable to climate change	Map risks to better target adaptation efforts	Agricultural agencies, water agencies, research centers
Medium term (6-18 months)	Introduce crops resistant to drought or water stress	Study the compatibility of certain crops with available soils	Research centers, farm operators, agricultural agencies
Long term (>18 months)	Reconsidering food policies in relation to water availability	Integrate water as a key indicator in regional agricultural production planning	Regions, local authorities, agricultural agencies, water agencies

2. Relevant funding avenues

Water Quality & Pollutant Management/Prevention

Horizon Europe

Call examples:

- **HORIZON-CL6-2025-02-CLIMATE-05: Strengthening the resilience of water systems and water sector to climate and global socio-economic change impacts**

The call focuses on strengthening the resilience of water systems and the water sector in response to climate change and global socio-economic impacts. This initiative aims to develop innovative solutions and strategies to enhance the adaptability and sustainability of water management practices. By addressing the challenges posed by climate variability and socio-economic shifts, the call seeks to ensure the long-term viability of water resources, safeguard ecosystems, and support communities dependent on these vital systems.

- **Water4All Partnership (Horizon Europe Co-funded Partnership)**

Type: Joint funding calls focused on water security
What it supports:

- Collaborative R&I projects on pollutant monitoring, circular water use, groundwater resilience, and smart management,
- Stakeholder engagement, living labs, and policy integration work.

LIFE Programme

Type: Funding for environment and climate action
Relevant sub-programmes:

- LIFE Environment & Resource Efficiency – projects tackling water pollution, circular water technologies, and PFAS reduction,
- LIFE Climate Adaptation – projects integrating water-related NbS and urban resilience planning.

- **Interregional Innovation Investments (I3) Instrument**

Type: Cross-border cooperation funding
Supports:

- Policy learning, capacity building, joint pilot actions between EU regions,
- NbS for water management, water quality monitoring, and integrated territorial strategies,
- Recent example: Water Test Network (Interreg NWE) – transnational access to testbeds for SMEs.

EUREKA/Eurostars

Type: SME-focused innovation support

- For water tech companies, digital service providers, and green chemistry innovators,
- Encourages international partnerships to commercialize water quality solutions.

Climate change adaptation

Horizon Europe

Call examples :

- **HORIZON-MISS-2025-01-CLIMA-01 : Supporting regions and local authorities in assessing climate risks**

The main aims is to enhance scientific knowledge of climate risks on a regional scale, using the CLIMAAX project's tools and multi-hazard assessment framework, and to support 70 regions and local authorities in understanding their current and future risks, improving their resilience plans, and better communicating these issues to non-specialist audiences.

- **HORIZON-MISS-2025-01-CLIMA-02 : Support to regions and local authorities in developing local Action Plans towards climate resilience**

The Action Plans developed by regions and local authorities will have to propose a list of concrete actions in favor of climate resilience, accompanied by their estimated costs and an analysis of the financing solutions that can be mobilized at different scales. They will involve all stakeholders (public services, citizens, businesses, research, etc.) and will be based on forward-looking scenarios incorporating robust and innovative solutions.

LIFE Programme

- LIFE Climate Adaptation : projects integrating water-related NBS and urban resilience planning.

Interreg

- Nature Based Solutions for water management, water quality monitoring, and integrated territorial strategies

The water-food nexus

The research and innovation EU policy, **Food 2030** is the framework supporting the transition towards sustainable, healthy and inclusive food systems, that respect planetary boundaries. This policy supports the goals of the European Green Deal, Farm to Fork strategy and Bioeconomy strategy. The opportunities identified in Water Smart Connect are aligned with the EU policy driving solutions to:

- climate change
- resources scarcity
- pollution and waste
- environmental degradation
- loss of biodiversity

Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment in Horizon Europe includes funding opportunities. Moreover, the I3, financed from the European Regional Development Fund (ERDF) represents an opportunity to support interregional portfolios of companies' investments bringing innovation to the market at high technology readiness levels (TRL 6-9) and reshaping EU interregional value chains.

Opportunities						
Pohjois-Savo Finland	Catalonia Spain	Sjæland Denmark	Centre-Val de Loire France	Occitanie France	Fryslân The Netherlands	Aragón Spain
Strategies to mitigate climate change impacts and improve environmental rehabilitation	Policies and funding specifically dedicated to R&D and innovation in the water sector.	Solutions to address PFAS contamination, stormwater overflow, and pollution of natural water bodies	Recruitment initiatives and training programs focused on natural resources and water management.	Better access to finance for SMEs/VSEs and support for internationalisation.	Support for scaling up innovations and building a complete value chain.	Increased awareness of the link between water quality, health, and the environment. Strategies to address low rainfall forecasts due to climate change.

V. Strategy Plan 2025-2028

The different phases of the project have identified common challenges between the regions and their ecosystems. Based on these elements, we have imagined a series of concrete actions to develop collaboration outside the consortium.
These actions are structured around a three-year timeframe and aim to lay the foundations for a collaborative and sustainable approach.

Challenges	Actions	Objectives	Expected outcomes
Support for innovative projects	Submit joint proposals engaging clusters members collectively in setting up projects	Strengthen European networking and cooperation and using the financing mechanisms identified during the project to develop projects	Involvement of partners from several clusters, project proposals on several key topics
	Organize matchmaking activities and joint events for clusters members to gather clusters members	Encourage best practices sharing and success stories	Organization of several joints events, remote or in person, improvement of the cohesion between the stakeholders
Geographic expansion	Identify regions with innovation challenges	Strengthen collaboration, stimulate innovation and maximize the project's impact on a European scale	The integration of new regions into the project helps strengthen visibility, and facilitate cooperation, thereby fostering sustainable and resilient growth.
	Identify regions with similar water challenges		
	Develop partnerships with organizations working for sustainable water management in other european regions		
	Develop information sharing towards target areas		
Diversification of partners	Draw up a list of potential partners	Strengthen the project's ecosystem and diversity	Several partners have been identified, with a diversification of expertise to strengthen resilience and innovation.
	Analyze and identify under-represented partners (SMEs, startups, NGOs, universities, etc.).		
	Adapt cooperation methods to accommodate partners from diverse innovative backgrounds.		
	Define indicators to measure the diversity of partners.		

	Deploy targeted communication campaigns to reach out to other networks		
	Encourage the involvement of groups through specific incentives or dedicated programs.		
	Organize cross-regional events accessible to various sectors (forums, webinars, etc.).		
	Identify funding sources that encourage the diversity of players (grants, European calls for projects, etc.).		
	Set up support systems to help new partners integrate the project effectively.		
	Use existing collaborative platforms to connect stakeholders from different sectors and regions (ICN network and Water Smart Territories for example).		
Raising public awareness	Create accessible media (infographics, videos, podcasts) to reach different audiences.	Promote public understanding, support and involvement in the project	Many regions are interested in the project
	Adapt the message to each region and local specificities to maximize impact.		
	Set up conferences, workshops and debates open to targeted partners.		
	Create social networking campaigns to stimulate interaction and engagement.		
	Develop educational actions in schools and universities to reinforce involvement.		
	Share testimonials from those involved to demonstrate the concrete benefits of the project.		
	Measure the impact of awareness-raising actions and adjust efforts according to public feedback.		