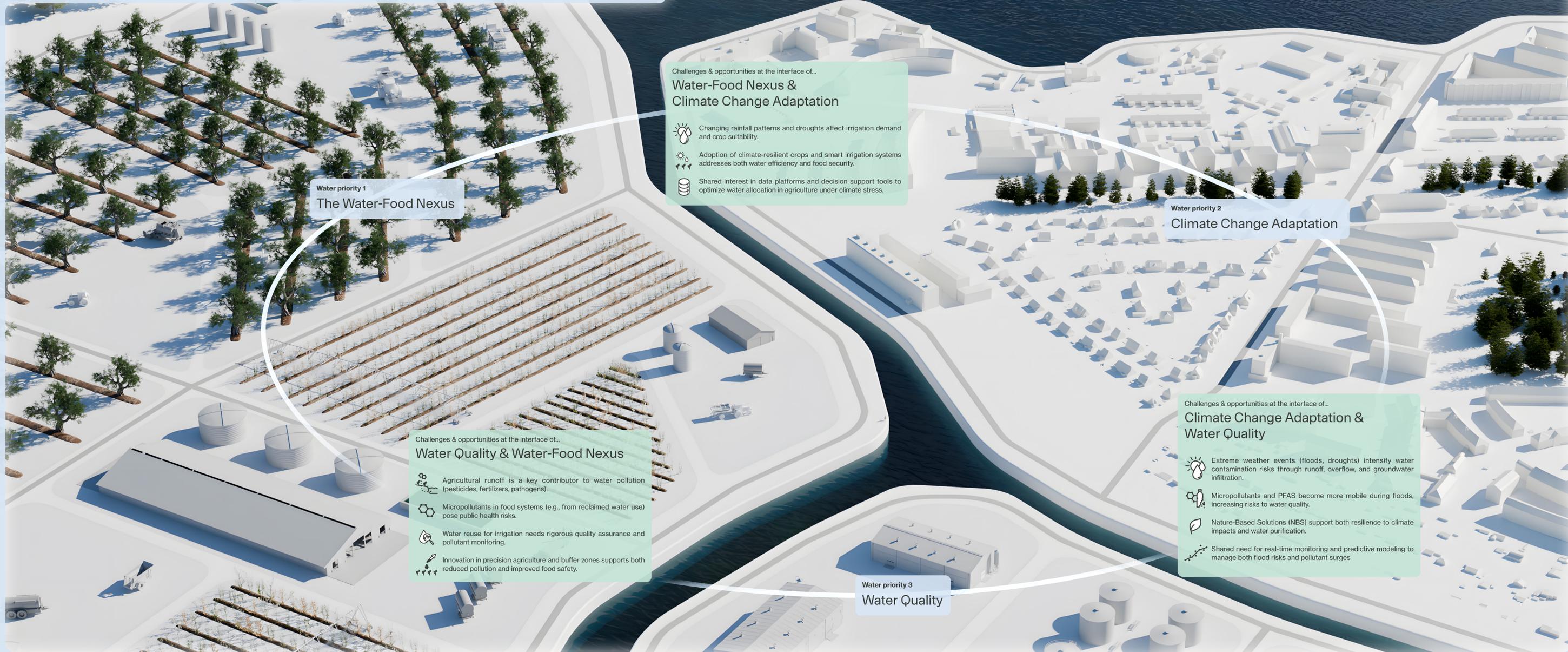


Through its commitment to more connected, inclusive, and efficient water innovation ecosystems, the Water Smart Connect project has supported the growth of companies and encouraged innovation to address critical water challenges. By identifying Water Priorities and gaps, WSC has collaborated with partners on R&I projects that offer future funding opportunities, advancing the future of water technology.

Before diving into each Water Priority, learn more about the scope of the project and the systemic challenges at the interface of the priorities!



## Project pilots

The pilots represent 7 regions from 5 countries, each with distinct water challenges and best practices.

Clean  
Sjælland, Denmark

Aquanova  
Centre-Val de Loire, France

Water Alliance  
Fryslân, the Netherlands

Zinnæ  
Aragón, Spain

Savonia - University of applied sciences  
Kuopio Water cluster  
Pohjois-Savo, Finland

CWP  
Catalonia, Spain

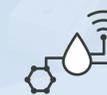
## Overarching challenges

Beyond the theme-specific challenges explored in the following posters, some overarching challenging were identified across the pilots and could become the starting points of further research consortiums:



### Cross-Cutting Governance & Policy Gaps

- Lack of harmonized EU-wide policy on cumulative pollutant thresholds and water reuse standards.
- Fragmentation in cross-sectoral collaboration – silos between agriculture, water management, and environmental regulation.



### Infrastructure & Technology

- Insufficient treatment capacity for emerging pollutants, especially in rural/agricultural zones.
- Monitoring systems and data-sharing platforms are underdeveloped or incompatible across regions.
- Deployment of digital twins, AI models, and sensor networks is uneven and underfunded.



### Capacity & Public Awareness

- Low public awareness of water pollution sources (pharmaceuticals, consumer products).
- Resistance to reclaimed water use in agriculture or urban areas due to safety concerns.
- Need for training and education for farm operators and municipalities on adaptive and integrated water solutions.

## Project timeline



Increasingly extreme weather patterns and the continued use of chemicals in agriculture are challenging the sector's practices. These challenges require targeted actions to ensure sustainable and resilient food production. The project has identified three main lines of action - Precision irrigation, Adaptation to climate change and Reducing chemicals and runoff - and proposed a roadmap to support these transitions.

Explore our cases to discover innovative solutions from other research projects.



### TECNOTRUF

The project aims for a new black truffle production and marketing model, optimizing irrigation with continuous tech monitoring and valuing fresh truffles/by-products better. It will monitor plantations ecologically and via drones, tracking data on a platform. A pilot will cover agronomy, by-products, and traceability. Innovation includes a single device for growers to monitor key environmental and plant data, enabling plant sensing for water use optimization in truffle cultivation.

ZINNAE  
Learn more about TECNOTRUF here:

### SMAGRI - Climate-smart water management

SMAGRI fostered climate-smart agriculture innovation at Savonia University through cross-disciplinary collaboration and stakeholder engagement. It aimed to advance knowledge, deploy smart water tools (like remotely controlled drainage tested on a field with sensors), and strengthen ecosystem integration. Key outcomes included better understanding, advanced data analysis, increased digitalization, improved collaboration, and informed stakeholders on smart water management and climate impacts.

**SAVONIA**  
UNIVERSITY OF APPLIED SCIENCES  
Learn more about SMAGRI here:

### 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.

**Identified challenges**

- Inefficient irrigation practices increase runoff, while techniques like drip irrigation minimize water usage and runoff
- Soil erosion and deterioration from runoff and the pollutants it transports

**Proposed implementation timeline**

- 0-6 months: Develop systems for monitoring input losses
- 6-18 months: Improve buffer strips and vegetated infrastructure
- >18 months: Encourage the transition to more sustainable agri-food systems

### 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.

**Identified challenges**

- Inconsistent water distribution due to soil type, topography, and irrigation system design
- Determining irrigation frequency and duration based on varying crop water needs, weather, and soil characteristics

**Proposed implementation timeline**

- 0-6 months: Install sensors and localized weather monitoring systems
- 6-18 months: Integrate decision-support tools into irrigation systems
- >18 months: Large-scale deployment of smart irrigation in vulnerable areas

### AquaLoops4Med

AquaLoops4Med, led by the Catalan Water Partnership with 13 partners, unites 4 European regions (Catalonia, Basilicata, Attica, Thessaly) facing shared water management issues due to climate change, impacting their significant agrifood sectors. The project aims to create an interregional network for efficient, sustainable Mediterranean water management, focusing on agrifood. This will be achieved by demonstrating technologies in Italy and Greece, supporting SMEs with funding, providing innovation ecosystem services, and promoting the transfer of solutions.

**CWP**  
Learn more about AquaLoops4Med here:

### Adaptation to Climate Change in Food Systems

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

**Identified challenges**

- Altered precipitation patterns, causing droughts and reduced water availability; efficient water management and drought-resistant crops are essential.
- Increased crop water needs due to higher temperatures and changing weather, requiring efficient irrigation systems and precise scheduling.

**Proposed implementation timeline**

- 0-6 months: Identify agricultural areas most vulnerable to climate change
- 6-18 months: Introduce crops resistant to drought or water stress
- >18 months: Reconsidering food policies in relation to water availability

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 pinpointed 3 main focus points - Water quality, Water management and Resilience territory and smart cities -, defining a roadmap to support these transitions.

Explore our cases to discover innovative solutions from partner companies (🔍) and other research projects (📄).

### SatWater & SatWater 2.0

Drought and climate change make surface freshwater vital but vulnerable to declining quality. The SatWater project created a tool combining satellite data, in-situ measurements, and weather data to predict surface water quality (turbidity, chlorophyll, algae). This aids managers in optimizing operations and anticipating issues. Piloted successfully, SatWater 2.0 expanded and validated the tool, adding an early warning system and user interface for improved water management and wider use, also evaluating satellite data reliability for water supply.

Learn more about SatWater projects here

### SmartBrønd

SmartBrønd optimizes urban stormwater management with smart solutions to prevent overload and promote reuse based on precise data and real-time monitoring. The technology enables control of stormwater as a valuable resource in climate adaptation projects.

Read more about SmartBrønd's solutions here.

### Noorderhoek Waterschoon Sneek

The redevelopment of the Noorderhoek district, in Sneek, replaced 282 old homes with 232 new ones, implementing sustainable technologies for lower energy use. The "Waterschoon" project uses a comprehensive mix of heat pumps, thermal storage, and a biogas boiler (from local waste). Grey water is also processed to recover heat, while nitrogen is removed using the OLAND process.

Learn more about Noorderhoek Waterschoon Sneek here:

### PrevizO

PrevizO addresses projected water scarcity in the Loire-Bretagne basin with an AI demonstrator for proactive water management. Led by the Centre-Val de Loire Region, the project uses frugal, transparent, and replicable AI (leveraging ecological data, open-source). Initially tested in the NEC, it aims to anticipate water stress. Awarded under France 2030, it was also selected for the Paris AI Summit. Four working groups will handle infrastructure, data, AI development, and user engagement.

Learn more about the PrevizO project here:

### 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.

- Identified opportunities**
- Sustainable agricultural practices
  - Cross-sector collaboration developed between the agricultural sector and the water sector
  - Quality monitoring and enhanced data analysis tools



### 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.

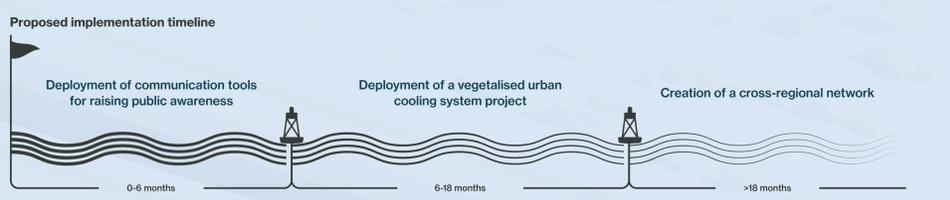
- Identified opportunities**
- Integrated tools management
  - Prediction models and data sharing
  - Nature Based Solutions
  - Smart innovations
  - Regional and national climate roadmaps



### 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.

- Identified opportunities**
- Urban adaptation plan
  - Vegetalised cities
  - Raising public awareness
  - Communication improved between cities with common challenges



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.

Explore our cases to discover innovative solutions from partner companies ( ) and other research projects ( ).



## REGAIN Project

This project explores advanced purification of wastewater treatment plant effluent (using techniques like nanofiltration) to create industrial process water. Pilot studies aim to identify the best approach for a large-scale system capable of supplying 10 million cubic meters annually, offering an alternative water source for industry.

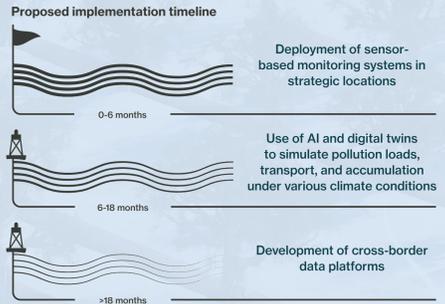


wateralliance  
Read more about REGAIN here.

## 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.

- Identified 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



## 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 the cumulative and synergistic impacts of mixtures, especially during high-load events like storms.

- Identified 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



### FieldFactors

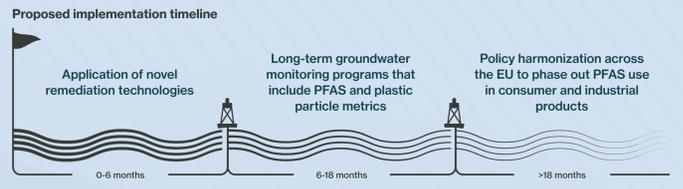
FieldFactors develop and installs nature-based water technology solutions to enable more circular water systems. In addition to acting as water buffers, these installations filter rainwaters, naturally ensuring that the collected waters are safe to reuse locally in systems ranging from irrigation to public space fountains and ponds.

wateralliance  
Learn more about FieldFactors here:

## 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.

- Identified 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



## Microbiological Potential of Infiltration Beds

To combat limitations in using infiltration beds for rainwater treatment, VIA University College, Byblomst, Bygros, and Silkeborg Forsyning collaborated. They investigated and documented the microorganisms in these beds using an innovative pilot-scale setup that simulates real conditions. This provided insight into how plants, microorganisms, and soil interact for water purification. The project's findings aim to validate and promote wider adoption of these nature-based solutions for urban water management.



Clean  
Learn more about Infiltration beds here:

## 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.

- Identified 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 use

