Water4All
Water security for the planet

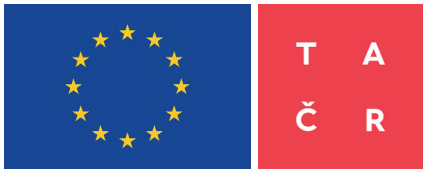
European Partnership

WATER4ALL TAP ACTION ON WATER AND BIODIVERSITY

AQUA-WISE

Implementation plan – April 2024

Co-funded by the European Union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Water4All
Water security for the planet


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Plan de Recuperación,
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AGENCIA
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List of Participants

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  - Project coordinator: José Antonio Batista Medina
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- **GRiWA** (FINLAND):
  - Main contact for TAP and project coordinator: Kaisa-Leena Huttunen
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Steering Committee Chair

The TAP Steering Committee is chaired by TA ČR (the Czech Republic)

Contact and Coordinator for International Cooperation

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Abstract

AQUA-WISE is a cluster of research teams within the Water4All TAP Action, addressing urgent environmental challenges such as the escalating water crisis, declining water quality, and biodiversity loss. Operating from January 2024 to December 2025, this initiative unites national projects from the Czech Republic, Finland, Ireland, and Spain to foster cross-border cooperation and harmonise research efforts across Europe and beyond.

Focused on the theme "Water for ecosystems and biodiversity," AQUA-WISE prioritises environmental engineering, ecohydrology, and ecosystem restoration. It aims to create a cluster of excellence, enhancing collaboration, innovation, and knowledge exchange to address pressing water-related issues.

David Hořák, the appointed Scientific Coordinator, leads the initiative in developing an Implementation Plan, identifying synergies among projects, and establishing sub-clusters for intensive collaboration. The initiative seeks to integrate diverse ecological insights and geographical perspectives, emphasising interdisciplinary approaches to enhance water quality and availability, and to conserve biodiversity in various aquatic and semi-aquatic ecosystems.

The cluster is integrated by researchers specialising in disciplines and areas of expertise such as: ecology, wetland and river ecosystem restoration, management and planning, ecosystem services, hydrobiology, eco-geography, environmental anthropology, political ecology, anthropology of conservation, environmental governance, economic anthropology, water resources, water management institutions and organisations, maritime anthropology, natural protected areas, food systems, environmental risks, community participation, fluvial geomorphology and catchment science, hydrology, hydraulics, economics, hydroeconomics, Nature Based Solutions, soil and water conservation, hydropedology, land consolidation, and planning, anti-erosion protection, pedology, remote sensing, digital soil mapping, soil science, erosional processes, modelling, environmental management, ecological restoration, zoological field monitoring, ornithology, batrachology, botany, vegetation communities monitoring, invasive species, hemiparasites application, grassland management, entomology, monitoring of bioindicative groups of arthropods, soil fertility, remediation of nutrients and pesticides, soil physics.

Key milestones include the creation of a "Who is Who" brochure, Implementation Plan, and joint research activities, along with training opportunities. **The main shared outputs from the whole cluster are: (i) a brochure describing the teams of AQUA-WISE, common grounds and outlook for future collaboration, (ii) publication of review or opinion paper.**

These outputs aim to inform policy-making, engage stakeholders, and contribute to the conservation and restoration of threatened wetland and peatland ecosystems.

Through strategic planning and knowledge transfer, AQUA-WISE strives to establish a sustainable collaborative network, leveraging collective expertise to address the complex challenges of water and biodiversity conservation effectively.

1. Introducing AQUA-WISE

1.1. Introduction and AQUA-WISE Relation to the TAP theme and the ToR

The Water4All TAP Action is a network of national projects focussed on specific Research, Development and Innovation (hereafter RDI) needs. It will address topics of environmental concern, with an aim of collating complementary research that will protect ecosystems and biodiversity. Good health of ecosystems and their capacity to host biodiversity and properly deliver their services is identified as Theme II in Water4All Strategic Research and Innovation Agenda1 (SRIA). These targets respond to pressing environmental issues such as (i) climate change, (ii) water quality and (iii) biodiversity loss. Current climate warming is affecting water availability through changes in temporal and spatial precipitation patterns, causing extreme weather events such as floods and droughts. Despite huge improvements since the 1950s, water quality (especially nutrient overload) remains the key environmental issue in both freshwater and marine ecosystems. A key global environmental issue, the loss of biodiversity, has a significant impact on freshwater ecosystems, also because all of the above issues are directly and indirectly linked through multiple co-occurring stressors and cascade environmental and ecological impacts.

The foundation of the TAP Action is the establishment of a network or cluster of excellence, comprising national projects that are focussed on the specific RDI needs of new and existing national calls. In so doing the TAP Action aims to **foster partnerships, creating a critical mass of research and technological excellence and the sharing of knowledge.**

The theme of this Action is: Water for ecosystems and biodiversity. This encompasses environmental engineering and ecohydrology for ecosystem restoration, multiple pressure–impact–response relationships, monitoring tools at different scales, harmonisation of methodologies for evaluation of surface water hydromorphology, impacts of hydrological extremes, and rehabilitation of water bodies.

This action will run for 24 months from January 2024 until December 2025.

The TAP Action creates an opportunity for multidisciplinary cross-border cooperation, greater collaboration and a more unified focus on water RDIs across Europe and beyond. It will allow coordination / cooperation between individual national projects, leading to a greater impact at the European and global level, and will address research gaps and avoid duplication.

The countries that take part in this joint action are

Czech Republic (CZ)
Finland (FI)
Ireland (IE)
Spain (ES)

AQUA-WISE TAP Kick-off meeting

The kick-off meeting took place on-line, on January 30th, 2024. Twenty-eight participants from 4 European countries connected to the workshop including: 4 Steering committee organisations and 8 national projects from Czech Republic, Finland, Ireland and Spain. The agenda covered an overview of the TAP Action implementation processes, introduction of all parties involved, their expectations, needs and the foreseen next steps. The event started with a plenary session which was complemented by a keynote by Maria Angeles Blanco who was a scientific coordinator of Aquatic pollutants TAP Action in 2022-2023. TAP concept and objectives were covered, followed by presentation of role and expectation of the TAP Steering committee and of the TAP cluster of members. Findings from the mapping survey were presented with a particular focus on crosscutting background and expectations. At the end of the plenary session, the national projects presented a brief introduction of their work and objectives.

The national projects were invited to join a discussion to discover synergies and common topics between the projects. The election of Scientific Coordinator was discussed and 2 candidates came forward: David Hořák (WETZONE, CZ) and Julia Buchtová (Wetland hemiparasite, CZ). It was agreed that candidates should write an introduction letter and the cluster will take a vote online.

After the meeting, David Hořák was elected as Scientific Coordinator with the mandate of leading the network and to start working on the Implementation Plan for the cluster.

As the first TAP output, the first activity was to better know each project,a **Who is Who brochure**, based on the summaries of the national RDI projects, was created by TAČR.

AQUA-WISE Prague in person meeting

On the 7th and 8th of March an in-person meeting was held in Prague, with the main aims of: (i) getting to know each other, (ii) identification of synergies and common activities, (iii) definition of links between different research projects, (iv) identification of possible outcomes, (v) introduction and start of works on the Implementation Plan.

A **Common grounds** document was reviewed and a roundtable discussion helped to identify additional synergies. These are detailed below and are open for further changes:

(1) **BIO-JUST** identified common grounds with NATURA and HymoGuide (blue water, water scarcity, Nature Based Solutions, policy and legislation, dissemination and recommendations).
(2) **GRiWA** project relates to BIO-JUST and WET-PEAT through water quality and its effects on people and its focus on biodiversity relates to many projects.
(3) **HymoGuide** saw potential for capturing information on hydromorphology-related activities and policy implementation in the partner jurisdictions and possibilities to share research best practices, especially related to data access and management.
(4) **NATURA** project focuses on policy makers and how they can use scientific work to make better policies in the future. NATURA could use the expertise of other projects and use their data within their modelling.
(5) **STRIPCROPP** saw connection through adaptation measures, erosion processes and water quality to the WETZONE project and mentioned the importance of setting good relations between farmers and policymakers.
(6) **Wetland hemiparasite** pointed out connection to GRiWA, WET-PEAT and WETZONE through biodiversity monitoring, connection with all other projects through satellite mapping, and water quality. Wetland hemiparasite expressed interest in living labs and a possibility of sowing hemiparasitic seeds in other locations such as Finland or Ireland.
(7) **WET-PEAT** project sees the link to STRIPCROPP, NATURA, WETZONE and a data exchange with HymoGuide.
(8) **WETZONE** project common grounds are mostly with Wetland hemiparasite, WET-PEAT through water quality and STRIPCROPP through soil. Links to GRIWA are possible via trophic level and fish stock.

Building on the insights and synergies identified during the TAP kick-off and in-person meetings, the AQUA-WISE cluster will focus on fostering interdisciplinary collaboration and developing innovative solutions to enhance water and soil quality, and conserve wetland biodiversity. The quantification of common interests and human capacity is available in the online **Common interests quantification** spreadsheet together with an indication of what individual projects can offer to the cluster.

1.2. State of art

The current state of freshwater ecosystems and biodiversity highlights the urgent need for collaborative efforts to address water pollution, habitat loss and degradation, and climate change impacts. Freshwater ecosystems are among the most threatened ecosystems globally, with a significant loss and degradation observed over the past century due to human activities like urbanisation, agriculture, and drainage for development. They are vulnerable to pollution from agricultural runoff, industrial discharges, and urban wastewater, leading to water quality degradation and loss of biodiversity. In addition, climate change poses a threat to wetland ecosystems through altered precipitation patterns, increased temperatures and sea-level rise, impacting their hydrology and biodiversity. Wetlands are further threatened by the introduction of invasive species that can disrupt wetland ecosystems, outcompeting native species or altering biotope structures. Unsustainable use of wetland resources, such as overfishing and unsustainable harvesting of vegetation, can lead to ecosystem degradation and loss of biodiversity. Biodiversity in freshwater ecosystems is also affected by structural changes linked to the loss of hydrological connectivity (e.g. dams, flood protection barriers, water storage). Despite these challenges, there are ongoing efforts at local, national, and international levels to conserve and restore freshwaters and wetlands. This is crucial also because anthropogenic changes in water quality and quantity, as well as in related ecological processes and ecosystem services may significantly affect the surrounding society:

- **Policy and Legislation**: Many countries have established policies and legislation to protect freshwaters and wetlands, such as the Ramsar Convention, an international treaty for the conservation and sustainable use of freshwaters and wetlands.
- **Freshwaters and Wetland Restoration**: Restoration projects aim to rehabilitate degraded freshwaters, wetlands and peatlands, enhance biodiversity, and improve ecosystem services through habitat restoration, water quality improvement and flood control, and invasive species control.

- **Community Engagement**: Engaging local communities in wetland conservation and management and pollution mitigation can help raise awareness, promote sustainable practices, and support livelihoods dependent on wetland resources.
- **Research and Monitoring**: Ongoing research and monitoring efforts provide valuable insights into freshwater, wetland and peatland ecology, hydrology, and conservation strategies, informing effective management practices and policy development. Citizen science approaches are already being used in research by some members of the cluster (such as GRiWA).

While freshwaters, wetlands and peatlands face significant threats, concerted efforts in conservation, restoration, and sustainable management can help protect these invaluable ecosystems for future generations. Collaborative research initiatives, such as this cluster, are essential to address the complex challenges facing wetlands and ensure their long-term health and resilience. AQUA-WISE aims to leverage the collective expertise and resources of national projects to advance research, develop innovative approaches, and support exchange of information between scientists and policy-makers in the field of water, soil and biodiversity conservation.

1.3. Novelty of our approach

Our approach emphasises the integration of diverse perspectives and expertise to foster collaboration, identify synergies, and develop joint activities that address the multifaceted challenges related to water and biodiversity conservation. Specifically, we will mostly integrate estimates of water and soil quality with hydrological regimes and wetland biodiversity monitoring and restoration. For this purpose, we will combine insights from different ecological systems (fishponds, rivers, peat bogs, marshes and agricultural land) and different geographical locations spanning latitude and longitude.

2. Main objectives and their correspondence to the TAP Action ToR

2.1. Main and specific objectives

Overall Objective:

To enhance collaboration among national research projects, fostering innovation and knowledge exchange in water and biodiversity conservation.

Specific Objectives:

- Develop a collaborative network of national projects focusing on water and biodiversity research.
- Identify and pursue joint activities and synergies among the projects.
- Involve existing university students working on specific projects in cluster activities.
- Preparation of the ground for future co-tutelle PhD topics and include cluster members in supervision of existing PhD students.

- Sharing relevant existing research projects between cluster members to improve quality of the outputs, developing common grounds and foster bilateral research within the cluster network.
- Contribute to the development of innovative solutions and policy recommendations through interdisciplinary research.
- Provide training opportunities for partner countries to address current research needs and to foster future collaboration.
- Identify related research gaps for the future research calls.

2.2. Alignment activities

- Alignment of the terminology and conceptual approaches in soil & water conservation.
- Unification of methodologies and data structure.
- Discussion of research outputs of national projects to enhance the output quality and foster international relevance.
- Discuss the research priorities in member countries and EU regions.
- Share knowledge and data including good practices and bad experiences.
- Prepare joint research outputs.
- Combine experts from different fields of ecology and environmental sciences.
- Align approaches of the different projects maintaining its diversity.
- Support collaboration with international institutions and researchers.
- Promote networking.

2.3. Expected Outputs

Short-term:

- Creation of an e-communication platform (**March 2024**)
- Development of a "Who is Who" brochure showcasing the participating national projects (**January 2024**).
- Identification of common grounds and synergies among the projects (**March 2024**).
- Development of Implementation Plan (**April - August 2024**)
- Creation of shared cloud space (**April 2024**)
- Definition of sub-clusters based on the common grounds within which more intensive collaboration and potentially specific research outputs are expected (**October 2024**)
- Development of the general scope of an opinion / perspective / review paper and its potential publication venue (**October 2024**)
- Search for additional projects from new countries (or already participating countries with fewer projects - not the Czech Republic) to join the TAP Action to fill thematic gaps (**June 2024**). Efforts to add two french projects dealing with conservation of wetland biodiversity biodiversity was not successful (**August 2024**)

Mid-term:

- Implementation of joint research activities and collaborative projects.

- Presenting the updates of projects' progression during an online meeting (**IV. quarter 2024**).
- Mobility activities between the cluster members (see details in the enclosed spreadsheet, minimum 2 visits between members of the cluster, apart from in-person meetings).
- Training and knowledge sharing activities, such as organising online workshops (2), there are two potential topics of wider interest (including partner organisations of the AQUA-WISE cluster):
    - spatial data analysis - sharing experiences and knowledge on different methods of analysing satellite/UAVs images, uses of these data in the context of ecosystem services, biotope state evaluation.
    - biodiversity analysis – sharing knowledge and experiences in analysing biodiversity across various ecosystems, including novel approaches, collaborations, and data exchange.
- Drafting of the opinion paper (or potentially more research outputs), final version **November 2025**
- The cluster aims to organise an international conferences session as a follow-on activity or even within the duration of the TAP action (e.g. Symposium for European Freshwater Sciences 14, **summer 2025**).
-

Long-term:

- Submission / publication of review or opinion paper (**December 2025**)
- The paper will be published in international journal and accessible to wider scientific community, we will make efforts to make it open access.
- Brochure describing the teams of AQUA-WISE, common grounds and outlook for future collaboration (**December 2025**)
- The brochure will be used for within cluster future collaboration planning, and to inform relevant institutions such as national ministries of environment about cluster potential and capacity. For the latter purpose a visually attractive version will be prepared to distribute among ministry departments.
- Establishment of a sustainable collaborative network for future research and joint project applications (**December 2025**).

Details of the progress of the collaboration will be recorded in a shared online spreadsheet, **AQUA-WISE: specific outputs, activities and indicators**.

3. Strategic Approaches and Methodology

3.1. Strategic Approach and Knowledge Transfer

AQUA-WISE will leverage the insights and synergies identified during the TAP kick-off and in-person meetings to develop a collaborative Implementation Plan. Virtual meetings and

communication platforms will facilitate ongoing collaboration and knowledge sharing among cluster members.

Deliverables, milestones

Deliverables:

- Cluster Implementation Plan (**April 2024**)
- Joint research projects and activities such as exchange of knowledge, data or unification of methodological approaches (**May 2024 - December 2025**), such as biodiversity sampling unification that already started between GRiWA, Wetland hemiparasite and WETZONE (April 2024).
- Research publication(s), potentially also a policy brief (**December 2025**)

Milestones:

- aqua-wise@googlegroups.com communication platform creation (**February 2024**)
- Appointment of the Scientific Coordinator (**March 2024**)
- Completion of the Implementation Plan (**April 2024**)
- Launch of joint research activities (**May 2024 - December 2025**)
- Completion of training activities, delivered online, in areas of mutual interest (**April 2024 - December 2025**)

4. Roles of AQUA-WISE members and division of work

4.1. Scientific Coordinator

David Hořák (david.horak@natur.cuni.cz, WETZONE, CZ) will serve as the Scientific Coordinator, responsible for:

- Ensuring scientific coordination of cluster activities
- Leading the development of the Implementation Plan and proposed outputs
- Representing the cluster at guided dialogues with the TAP Steering Committee
- Supporting networking and collaboration among cluster members

4.2. Cluster Members

AQUA-WISE Cluster members will contribute to the cluster's objectives through research, collaboration, and dissemination activities, focusing on the identified common topics:

- **Water and soil quality,** including sharing of methodologies for sampling and testing of water and soil, flow measurement, potential sample analyses in partner laboratories.
- **Freshwater and wetland biodiversity**, including unification of methodological approaches, data and good practice sharing, joint development of conservation strategies.
- **Policy recommendations**, including experience sharing in implementation of conservation and enhancement measures.

- **Remote sensing and spatial analyses,** including the organisation and delivery of training sessions and discussion of projects/methodologies.

5. Timing and purpose of biannual working meetings

Biannual working meetings will be scheduled to review progress, discuss challenges, and facilitate collaboration among cluster members. A final seminar will be organised to present the cluster's outcomes to funding organisations, stakeholders, and the public.

year	2024				2025			
quarter	I.	II.	III.	IV.	I.	II.	III.	IV.
activity								
kick-off meeting								
aqua-wise@googlegroups.com platform creation								
all cluster in-person meeting								
all cluster on-line meeting								
Output definition								
Who-is-Who brochure								
Common grounds								
Sub-clusters definition								
Implementation Plan								
Opinion paper scope & venue								
Network Brochure Concept, detailed								
Sub-cluster on-line meetings								
inter-team mobility								
training and knowledge sharing activities								
Opinion paper outline								
Opinion paper writing								
Opinion paper submission								
Network Brochure writing								
Network Brochure finalisation								

6. Impact: Implementation plan of the TAP results

6.1. Exploitation strategy

The cluster's outcomes will be disseminated through various channels. Support from the TAP Steering Committee will be sought to ensure the successful implementation and impact of the cluster's activities.

6.2. Added Value for Researchers

The success of the AQUA-WISE TAP Cluster will be determined by the commitment, involvement and contribution of all participants in the Implementation Plan. AQUA-WISE will generate added value knowledge about how water and soil quality, together with wetland management, improves biodiversity and quality of freshwater ecosystems. In relation to the outcomes for researchers within AQUA-WISE, it will:

- Foster knowledge exchange and transfer
- Build the researchers' capacity through integrated, transnational and multi-disciplinary approaches and exchanges of good practices
- Provide the researchers with enhanced opportunities for mobility and sharing of/access to infrastructure
- Allow researchers to inform the contents of the Strategic Research & Innovation needs for future funding
- Provide researchers with opportunities for networking inside and outside of the cluster
- Facilitate the application for other funding at international and national level
- Facilitate cooperation, potentially resulting in high-impact scientific publications
- Improve the researchers' awareness of research priorities in other countries and how their needs overlap.

6.3. Added Value for Funders

- Ensure that the insights and solutions developed by nationally funded research are in line with international consensual perspectives and thus have a greater impact on and greater relevance to stakeholders and society.
- Benefit from other national programs to contribute to Global Environmental Challenges related to water & soil quality and wetland & freshwater biodiversity.
- Bring together EU research teams in an explicit collaborative manner and build a long-term future collaboration both at the whole cluster level and sub-cluster or bilateral level.
- Contribute to research and application alignment at all levels. The cluster will contribute to achieving the expected added values set out in the ToR by fostering collaboration, advancing research, and promoting innovation in water and biodiversity conservation.

6.4. Key outputs and indicators of progress

- Meetings, webinars
- Staff and student exchanges
- Bilateral publications
- Policy recommendations adopted
- Review / opinion paper

6.5. Target audience/stakeholders

- Research institutions
- Policy makers
- Private sector representatives
- Municipalities
- Civil society organisations

6.6. Dissemination strategy

A comprehensive dissemination strategy will be implemented, targeting both internal and external audiences through publications, meetings/workshops, and voluntary webinars.

7. Ideas for Sustainability and Legacy

The cluster aims to establish a long-term collaborative network, ensuring the sustainability of research efforts beyond the duration of the TAP Action. Knowledge transfer activities will be prioritised to build capacity and foster innovation in water and biodiversity conservation.

- At the end of the TAP Action, the scientific coordinator will organise an on-line meeting (or it will be part of the last physical meeting) to discuss preparation applications for future funding calls.

8. Data Management

8.1. Types of data

- Research findings, databases - biodiversity dataset such as spatial distribution of individual taxa, climatic datasets, spatial layers etc.
- Project documentation
- Opinion / Review paper
- Bilateral research outputs

8.3. Data exploitation and sharing

During the design and implementation of the project, data will be stored on a shared cloud storage (Google Folder) created by TAČR. The shared cloud folder is managed by TAČR and the research coordinator, David Hořák. All project members will have access according to the established access rights. Upon completion and publication of the results. Subsets of data will be published, together with the publication of the scientific outputs of the project,

and will be made accessible for verification and re-use through open access repositories and platforms.

8.4. Data curation and preservation

Data will be curated and preserved following best practices and standards to ensure long-term accessibility and integrity. Data are stored digitally in commonly used formats, e.g. for vector GIS data we use the format Shapefile, for raster data ESRI raster formats and GeoTiff, for raw data proprietary formats as required, numerical data are stored in databases, or in a database such as *.xls. Data that can be reused after the end of the project, taking into account their nature, interests of stakeholders and publication of the results, will be made available to third parties under standard publishing licences.

8.5. Costs for data curation and preservation

Funding for data curation and preservation, if any, will be included in the cluster's budget. Cloud space was offered by TAČR free of charge.

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