

Water4All

Thematic Annual Programming (TAP) Action

Who-is-Who AQUA-WISE BROCHURE



Co-financed by the Connecting Europe
Facility of the European Union



The Water4All Thematic Annual Programming (TAP) Action is an additional call in the Water4All partnership.

It relies on the establishment of a network or cluster of excellence of national projects focussed on specific RDI needs from new or already started national calls in order to partner them, creating a critical mass of research and technological excellence, and ensuring the integration and sharing of knowledge.

The general theme selected for the first Water4All TAP Action is Water and Biodiversity, based on the Water4All SRIA Theme II - Water for ecosystems and biodiversity, and encompasses environmental engineering and ecohydrology for ecosystems restoration, multiple pressure-impact-response relationships, monitoring tools at different scales, harmonisation of methodologies for evaluation of surface water hydromorphology, Impacts of hydrological extremes, rehabilitation of water bodies.



The following projects are members of the TAP Action cluster

| Country | Acronym | Project coordinator | Main contact for TAP | Organisation | E-mail |
|---------|----------------------|--|------------------------------|-------------------------------|----------------------------------|
| CZ | WETZONE | David Hořák AQUA-WISE Scientific Coordinator | David Hořák | Charles University | david.horak@natur.cuni.cz |
| SP | BIO-JUST | José Antonio Batista Medina | Noelia García Rodríguez | Universidad de La Laguna | ngarciro@ull.edu.es |
| FI | GRIWA | Kaisa-Leena Huttunen | Kaisa-Leena Huttunen | Finnish Environment Institute | kaisa-leena.huttunen@syke.fi |
| IR | HymoGuide | Jonathan Turner | Jonathan Turner | University College Dublin | jonathan.turner@ucd.ie |
| SP | NATURA | Carlos Dionisio Pérez-Blanco | Carlos Dionisio Pérez-Blanco | Universidad de Salamanca | Dionisio.perez@usal.es |
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WETZONE

Biological diversity of overgrowing transition zones at fish ponds in Třeboňsko PLA: State evaluation and solutions

Keywords: Biodiversity; animals; plants; wetlands; man-managed fishponds; succession; active management; habitat micro-climate

Lead organisation:
Charles University

Project duration:
04/2023–03/2026



David HOŘÁK

Coordinator and main contact

Areas of expertise: Ecology, Eco-geography, Biodiversity, Birds, Wetlands, Savanna, Forest, Europe, Africa

Funding agency (Country)

Technology agency of the Czech Republic (CZ)

Abstract

One of the biggest current environmental issues of Třeboňsko LPA is absence of traditional agriculture and lack of active landscape management, which lead to deterioration of quality of wetlands mainly due to development of forest succession. In this project, we assess temporal changes and the impact of the overgrowth of fishpond transition zones in Třeboňsko PLA by woody plants on the structure of ecological communities in selected taxa of animals and plant community types. We will compare three types of wetland zones which are currently most represented: (i) low wetland vegetation, (ii) reed beds, (iii) willow growths; and also represent different phases of succession and parts of the ecological gradient. Apart from evaluation of spatial patterns at landscape scale, we will establish an experimental site at which we will evaluate the effects of woody plants elimination on temporal changes in community structure and describe microclimatic conditions in studied biotopes. The project will provide an expert basis enabling future practical management of wetland landscapes.

Expected outputs

- (1) Methodology for the management of the overgrown transition zones of fishponds
- (2) Long-term changes in the geographical distribution of tree species in the transition zones of ponds of the PLA Třeboňsko Nmap - Specialized map with expert content
- (3) Biodiversity of selected groups of animals (birds, invertebrates) in the transition zones of ponds of the PLA Třeboňsko: importance of vegetation type - Summary research report
- (4) Geographical analysis of overgrowth of wetland transitions of ponds: long-term changes in the landscape of Třeboňsko - Research article
- (5) Structure of bird and invertebrate communities in the transition zones of Třeboňsko fishponds: Influence of habitat type and season - Research article

Other Contact points

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Areas of expertise: Spatial data science in ecology, landscape ecology, spatial data quality

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Areas of expertise: Wetland and river ecosystem restoration, management and planning, ecosystem services, hydrobiology

BIO-JUST

Biodiversity and ecosystem protection driven by environmental justice

Keywords: Nature-based solutions, groundwater conservation, protection of aquifers, springs, natural protected areas, La Palma, Canary Islands, Spain

Lead organisation:
**German Institute of Development
and Sustainability (IDOS) - Germany**

Project duration:
12/2022-12/2025



Noelia García RODRÍGUEZ

Main contact / University of La Laguna

Areas of expertise: Social and Cultural Anthropology, Environmental Anthropology, Political Ecology, Anthropology of Conservation, Environmental governance

Other partner organisations

Wageningen University - The Netherlands, Universidade Federal do ABC - Brazil, Bureau de Recherches Géologiques et Minières - France, Universidade de Lisboa - Portugal, Universidad de La Laguna - Spain, Associação Natureza Portugal (WWF) - Portugal, Société Anonyme des Eaux Minérales d'Evian, DANONE group - France

Funding Agency

Agencia Estatal de Investigación (AEI) - Spain

Abstract

The Spanish part of BIO-JUST is carried out in La Palma, an island located in the north-western part of Canary Islands (Spain). In La Palma the main source of income for the local communities is agriculture, in particular, the cultivation of bananas for export. Tourism has also some relevance and is expected to develop more in the coming years; however, it is still far from the socioeconomic importance it has in other islands of the archipelago. In general terms, the majority of tourists who come to La Palma are interested in nature-based tourism. The entire island was declared a Biosphere Reserve and it has different protection figures, including a National Park. Throughout history, the island has relied on water and other natural resources. The water in La Palma is mainly groundwater that comes from aquifers through springs (the historical source of water), water galleries and tube wells. Until the 1950s, the springs gave the water necessary for agricultural, urban and domestic uses. Nevertheless, since the 1970s springs have been seriously affected by the extraction of groundwater through water galleries. Many springs have disappeared and others have lost a significant portion of their flow. We aim to describe and analyse the measures and policies implemented to protect and recover the aquifers and springs of the island, which are essential for biodiversity conservation. In particular, we assess the construction of closures in the water galleries (an example of a nature-based solution; a type of aquifer recharge) and its socioeconomic and socioenvironmental effects.

Expected outputs

The subsistence of local populations, the sustainability of the economy, and the biodiversity conservation of La Palma depend on the wise management of the groundwater resources. To ensure efficient water management, it is essential to have an appropriate mix of soft measures, such as policies and management strategies, and hard measures, such as technologies and infrastructure. In a scenario also marked by climate change and the growth of tourism, a rigorous assessment of the implementation and effects of the closures in the water galleries (NbS) of the island will help to find the best solutions to recharge the aquifers (especially, the COEBRA aquifer) and protect the springs. BIO-JUST La Palma will analyse the social-economic and social-environmental benefits of the closures in the water galleries, their distribution among different sectors of society, and the direct and indirect negative impacts and costs. Their identification is important to achieve socially just and ecologically effective outcomes simultaneously. The project will also include possible strategies to mitigate the negative effects of the NbS.

Other Contact points



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More Information

www.biodiversa.eu/2023/04/19/bio-just/

GRIWA

Greener rivers in the warming Arctic? Anticipating the short- and long-term effects of additional nutrient inputs.

Keywords: Ecosystem effects, pink salmon invasion, subsidy resources

Lead organisation:
Finnish Environment Institute

Project duration:
08/2023–07/2027



Kaisa-Leena HUTTUNEN

Coordinator and main contact

Areas of expertise: Aquatic & community ecology, biodiversity research, temporal patterns

Abstract

Non-native pink salmon (humpback salmon; *Oncorhynchus gorbuscha*) has in recent years had mass occurrences in north European rivers, especially in Norway and Finland. Pink salmon has 2-yr anadromous and semelparous life cycle. All returning adults die after spawning and their carcasses remain in rivers or end-up to the riverbanks. In its native distribution areas pink salmon carcasses and nutrients released from them are a key subsidy resource both for rivers and their terrestrial surroundings. Arctic ecosystems in general are inherently ultra-oligotrophic, thus any amount of additional nutrients may be expected to trigger ecological responses. Consequently, additional resources from pink salmon carcasses may have potential to boost northern river ecosystems, but that will likely happen at the cost of native biodiversity. The unstudied dichotomy of threats versus opportunities sets the basis for the research project. Combining ecology, hydrology, physical geography, and human sciences it aims 1) to study the potential of additional resources to alter the rates of key ecosystem functions and change community structure of the native fauna and flora, 2) to explore the potential for complex effects across food webs and aquatic-terrestrial ecosystem boundaries, and 3) to provide rigorous scientific data to evaluate the severity of the impacts of pink salmon invasion from different perspectives to evaluate the need for mitigating the effects. Potential effects are studied at different temporal scales from immediate to short- and long-term. Pink salmon is used as an example of climate change linked to additional nutrient inputs that Arctic ecosystems are facing in future years.

Expected outputs

This research is based on extensive field studies, mesocosm experiment, meta-analysis, and in-depth interviews. Data will be collected mainly from northernmost Finland and Norway i.e., areas of few years or no (pink salmon) invasion history thus far. In addition, existing data from the Kola Peninsula will be used to represent areas of long (decades) invasion history. The research project includes two doctoral theses projects each providing 3 peer-reviewed scientific articles on ecological (and societal) effects of pink salmon invasion and increased availability of nutrients in general. Overall, the research project aims to increase fundamental understanding about anthropogenic biodiversity changes especially in arctic areas, but it has also a distinct practical aim to provide high-quality data and scientifically justified recommendations for environmental managers and decision makers regarding pink salmon invasion. More specifically, this research will help predict the spatial and temporal magnitude of the expected changes due to biological invasions in the warming world. The project will have a high national and international visibility via its active multidisciplinary collaboration network which will enhance the wide accessibility of the results. Accessibility, and thus the impact of the research, is further advanced via, for example, social media, national newspaper articles, and local seminars, workshops, and policy briefings.

Other Contact points

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Areas of expertise: Aquatic ecology, diatoms

HymoGuide

Guidance for Regulatory Standards in Hydromorphology for Surface Waters in Ireland

Keywords: Surface waterbodies; hydromorphology, regulations, standards, Water Framework Directive

Lead organisation:
University College Dublin

Project duration:
04/2023–03/2026



Jonathan TURNER

Coordinator and main contact

Areas of expertise: Fluvial geomorphology
and catchment science

Other partner organisations

cbec eco-engineering, Inland Fisheries Ireland

Funding Agency

Environmental Protection Agency (Ireland)

Abstract

HymoGuide aims to provide recommendations for the setting-up of standards for hydromorphology to support the development of regulations in Ireland. This will be achieved through an integrated research design employing (i) critical review and synthesis of existing knowledge, (ii) data analyses involving the testing of methods, tools and datasets across a gradient of hydromorphological typologies and pressures, and (iii) stakeholder participation and engagement. The results from HymoGuide will support activities related to the assessment of hydromorphological pressures, build on current understandings of the links to ecology and specific biological quality elements, and provide an evidence-base for the implementation of mitigation measures as mandated by Article 11 of the EU Water Framework Directive (2000/60/EC).

Expected outputs

A comprehensive review of the national and international state of knowledge related to hydromorphological pressures, impacts & links to ecology and methods/tools for assessment.

Report setting out recommendations for standards on hydromorphology for surface waterbodies (rivers, lakes and TRaC) in Ireland.

Other Contact points

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Areas of expertise: Applied freshwater ecology

NATURA

Nature-based Solutions for Resilient Adaptation to Water Scarcity and Hydroclimatic Extremes

Keywords: NbS, robust decision making, water scarcity

Lead organisation:
Universidad de Salamanca

Project duration:
07/2023-06/2025



Carlos Dionisio PÉREZ-BLANCO
Coordinator and main contact

Areas of expertise: Economics,
Hydroeconomics, Nb

Abstract

The main objective of NATURA is to develop economic, regulatory, and disaster risk financing instruments that upscale the adoption of NbS and achieve resilient adaptation to water scarcity and hydroclimatic extremes. To this end, NATURA will field an innovative ecosystem of innovation that combines ① an inclusive and transparent stakeholder engagement and knowledge sharing method, the knowledge networks, with ② an actionable modeling suite that integrates cutting edge socio-ecological ensemble modeling into the Decision Support System (DSS) used by stakeholders, so as to design, demonstrate feasibility and performance, and catalyze the implementation of NbS in ③ three living labs that inspire similar processes elsewhere: the Douro River Basin (RB) in Spain, the Reno RB in Italy, and the Nitra RB in Slovakia.

Expected outputs

Design and demonstrate institutional and technical feasibility and performance of a transition towards economic and environmental resilience in 3 labs exposed to water scarcity and extremes.

1. Design, test, and inform the adoption of 1 synergistic adaptation strategies that combine NbS with economic, regulatory, and risk financing instruments in each lab.
2. Establish 5+ “inspiration” labs that initiate development of NATURA ecosystem of innovation.
3. Synthesize and upscale the results obtained in the targeted labs to inform 4+ key national strategies (including Plan Adaptación Cambio Climático, Estrategia Nacional Infraestructura Verde) and 4+ EU strategies (including Green Deal strategies).

Other Contact points



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Areas of expertise: Economics,
Hydroeconomics, NbS

STRIPCROPP

Strip cropping management as an adaptation measure to optimize landscape water management

Keywords: Strip cropping management; adaptation measures; erosion and runoff conditions; water erosion

Lead organisation:
Brno University of Technology

Project duration:
04/2023–03/2026



Miroslav DUMBROVSKÝ
Coordinator and main contact

Areas of expertise: Soil and Water Conservation, Soil Erosion Control, Hydropedology, Land Consolidation

Abstract

The project develops a comprehensive view of the issue of strip cropping management (SCM) as an adaptation measure to optimise the water management of the landscape with its main and accompanying functions, including an evaluation of its effectiveness on erosion and runoff conditions when located on areas at risk of erosion in the agricultural landscape. One of the sub-goals is to verify the positive effect of SCM in terms of protecting the physical, chemical and biological properties of agricultural land, especially the effect on the complex of hydrophysical properties, the hydrolimit in the context of soil moisture dynamics, soil retention capacity and the microclimate. The project solves the biodiversity of the epigeic fauna in individual belts with different crops.

Expected outputs

Among the key outputs is the development of a methodology, where knowledge and outputs from the project solution will be recorded in the form of methodological procedures applicable in the conceptual planning of activities under the responsibility of the Ministry of Agriculture and also in the State land Office of the Czech Republic. The methodology will contain procedures on how to work, and design Strip cropping management and it will contain practical examples. Other outputs are professional articles (Web of Science, SCOPUS, etc.), a chapter in a book and participation in national and international conferences

Other Contact points



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of Strip cropping management

Wetland hemiparasite

Development of technology for growing seeds of hemiparasitic plants and its application in reducing invasive species in lowland meadow wetlands

Keywords: Ecological restoration, eutrophic habitats management; hemiparasite; *Melampyrum arvense*; *Odontites vernus*; plant invasion; wetland; wet meadow

Lead organisation:
Masaryk University

Project duration:
05/2023–03/2026



Marie KOTASOVA ADAMKOVA
Coordinator and main contact

Areas of expertise: Nature conservation, environmental management, ecological restoration, zoological field monitoring, ornithology, batrachology

Abstract

Historically, wetlands functioned as important water reservoirs in the country, as a natural air conditioner, and simultaneously were known for the occurrence of many wetland communities. However, in recent decades they have become highly endangered biotopes negatively affected by overgrowth and spread of aggressive invasive and expansive species, including the reed *Phragmites australis*, and the asters *Symphotrichum lanceolatum* and the goldenrod *Solidago* sp. This resulted in the community becoming homogeneous with minimal diversity of the original biota. The proposed project will provide a new environmental solution to this issue, particularly for wetlands which suffer from long term lack of appropriate care. The proposed project involves controlling plant invasions and reed overgrowth using hemiparasitic species *Odontites vernus* and *Melampyrum arvense*. The project will also include monitoring of the development of plant and animal biodiversity in wetlands threatened by plant invasions. We hypothesise that the use of hemiparasites to control invasive species in combination with mowing or cattle grazing is a significantly more effective measure than either of the management measures alone. This is because grazing and mowing only removes biomass that grows above the surface, whereas hemiparasitic plants, which obtain resources from underground organs of host plants, can be lethal to invasive species. The management will help restore the landscape and strengthen its ecological stability. A multidisciplinary approach will allow for comprehensive monitoring of biodiversity, providing an important variable for evaluating the impact of implemented measures and the subsequent use of the knowledge gained in the care of other wetlands.

Expected outputs

1. Summary Research Report: Restoring the biodiversity of lowland wetlands with hemiparasitic plants *Odontites vernus* and *Melampyrum arvense*. The output will summarise new findings on the restoration of lowland wet meadows achieved by sowing hemiparasitic species *Odontites vernus* and *Melampyrum arvense* and the subsequent maintenance by mowing and cattle grazing. The innovative approach to the restoration of wetland sites using hemiparasites will also be interpreted in terms of its impact on the biodiversity of bioindicative components of the wetland community.
2. Methods approved by the competent state administrative body under whose jurisdiction the issue falls: Use of hemiparasitic plants *Odontites vernus* and *Melampyrum arvense* to suppress invasive species in lowland wetland habitats. The result will be a methodology describing the use of sowing hemiparasites *Odontites vernus* and *Melampyrum arvense* to suppress wetland invasive plants. The methodology will include detailed and proven sowing procedures, including an appropriate schedule, the optimal amount of seed for a given area and appropriate aftercare measures.
3. Methods approved by the competent state administration body under whose jurisdiction the given question falls: Technology for the cultivation of seeds of the hemiparasitic plants *Odontites vernus* and *Melampyrum arvense*. The methodology includes a description of the technology for growing seeds of the hemiparasitic plants *Odontites vernus* and *Melampyrum arvense*. The aim is to make the knowledge gained during the development of the technology available to the professional public and thus significantly increase the availability of seeds.

LIFE IN SALT MARSHES

Complex ecological restoration of degraded and disappearing salt marshes in Moravian Pannonia

Lead organisation:
Masaryk University

Project duration:
08/2023–12/2029

Investor:
European Union

Other Partner Organisations:

Research Institute for Soil and Water Conservation

South Moravian Branch of the Czech Society for Ornithology

World from Space

Abstract

Proposed project focuses on complex ecological restoration over 500 ha of wetlands located in the agricultural landscape of southern Moravia. This area is divided among ten project localities, each a Natura2000 site. All the project localities include remnants of priority habitat *1340 inland salt meadows, which are in a degraded and diminishing state. For the reporting period 2013-2018, the inland salt meadows got an unfavourable-bad status on both national and international level for. The project localities are threatened by massive overgrowing by expansive and invasive species, eutrophication, nutrient pollution, disruption of natural water regime, lack of management, and consequent homogenization and loss of biodiversity. Our aim is to restore and stabilize the areas with priority habitat of inland salt marches, to renew wetlands' ecosystem functions, improve water quality and water retention, create new habitats and suitable conditions for target endangered wetland/salt meadow species, strengthen their populations and increase overall biodiversity. Complex ecological restoration will combine traditional methods of management (grazing, controlled burn-off, mowing, turf disruption) together with innovative methods (introducing semi-parasitic plant species to mitigate growth of expansive and invasive plant species, supporting wetland flora by additional targeted sowing of regional seed mixtures, or employing a method of green hay from the well-preserved wetland localities). To address the water pollution and negative effects of previous drainage, we will perform a complex hydro-chemical analysis and install close-to-nature biotechnical measures or natural small water retention measures. In order to verify the effect of project activities, we will perform a detailed biomonitoring and quantitative analysis of ecosystem services and landscape heterogeneity, before and after the project's realisation.

Other Contact points

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More Information

envirop.cz/en/projects/development-of-technology-for-growing-seeds-of-hemiparasitic-plants-and-its-application

WET-PEAT

Re-wetting of Peatlands for Enhanced Restoration

Keywords: Hydrology, water quality, modelling

Lead organisation:
University of Galway

Project duration:
03/2022–03/2026



Mark HEALY

Coordinator and main contact

Areas of expertise: Water quality, soil fertility, remediation of nutrients and pesticides, soil physics, hydrology

Other partner organisations

Trinity College Dublin, Irish Centre for High-End Computing (ICHEC)

Funding agency

Environmental Protection Agency (Ireland)

Abstract

Bord na Móna has recently transformed into a sustainable, green business, which now emphasises the use of its land assets for renewable energy and resource recovery in support of government policy and national decarbonisation commitments. As part of this transformation, the Peatlands Climate Action Scheme (PCAS) will, over the coming years, establish engineering and ecology works on 33,000 ha of bogs to accelerate natural restoration processes. These actions will increase carbon storage and reduce carbon emissions, improve water quality and water attenuation, and will enhance biodiversity while mitigating the risk of wildfires. The WET-PEAT project ('Re-wetting of peatlands for enhanced restoration'), will support the work of Bord na Móna in their restoration of over 33,000 hectares of peatlands. The project comprises researchers from the University of Galway, ICHEC, and Trinity College Dublin. WET-PEAT will apply state-of-the-art modelling techniques to a representative selection of Ireland's peatlands to provide additional insight into how restoration measures may be enhanced. In order to do this, the WET-PEAT project partners will use a mixture of on-site measurements of water quality and flow, and remote sensing, to monitor bogs before and after restoration work.

Expected outputs

1. Provide independent assessment of the PCAS work and supplement existing data collected at specified study sites.
2. Deliver recommendations for any changes in management and execution of the restoration programme, based on scientifically sound empirical data and stakeholder engagement.
3. Assess, measure and evaluate water quality parameters and flows from peatlands before and after restoration.
4. Provide an evaluation of the overall benefits and drawbacks associated with water quality improvements and alterations to catchment flows.

More Information

sites.google.com/view/wet-peat/home

The TAP Scientific Coordinator

The TAP Action will be chaired by a Scientific Coordinator. The Scientific Coordinator will be selected among the researchers involved in the TAP Action during the kick-off meeting (in January 2022) by the TAP Action members themselves. Afterwards, the TAP Scientific Coordinator has to be confirmed by the TAP Steering Committee. Candidacy for this role will be on a voluntary basis.

Role

The role of the TAP Action Scientific Coordinator is to:

1

Ensure the scientific coordination of the TAP Action activities.

2

Lead the work in developing the TAP Implementation Plan.

3

Lead the work in developing the proposed TAP Action outputs.

4

Represent the cluster at the midterm guided dialogue with the TAP Steering Committee.

5

Lead the work in developing the final follow up of the TAP Implementation Plan.

6

If requested, support additional foresight exercises carried out by the JPIs in the selected scientific area of the TAP Action.

Share good and bad experience, results and know-how.

Discuss ongoing national research on the EU level.

Discuss common methodologies.

Combine expertise from different disciplines.

Identify knowledge gaps.

Better understand research priorities and approaches in other countries.

Possible future cooperation on EU-funded research projects.

Identify global and local environmental policy issues that could be improved in order to secure water for the planet.

Exchange water-related data.

Contribute to water-related knowledge.

To strengthen the water research network.

Achieve synergies that will allow us to provide tools for better water management.

Possibility of testing new procedures under similar geographical conditions.

TAP EXPECTATION

Steering Committee Chair

The TAP Steering Committee is chaired by TA CR (the Czech Republic) who has the overall responsibility for carrying out and coordinating the setting up, implementation and evaluation of the Water4All TAP Action.

Contact

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TA CR as lead for this Water4All TAP Action will act as TAP Action Administrator, during the first two years of its existence. Costs will be covered by Water4All European partnership management costs assigned to TA CR in advance.

TA CR will help with

- supporting the TAP Scientific Coordinator;
- organising meetings (agenda, documentation, minutes);
- facilitating communication within the TAP Action members and with the TAP Steering Committee;
- supporting the Cluster in the preparation of the Implementation Plan of the TAP Action and its implementation;
- external communication- disseminating and creating dissemination leaflets/contents- for JPIs' web pages;
- ensuring regular updates and communication between the TAP Steering Committee and Water4All European partnership
- circulating exploratory survey about expectations of the Action members.