

Impact Objectives

- Promote dialogue and collaboration between science and society
- Work in four river basins to support sustainable water management and adaptation
- Develop a handbook to reach out to others wishing to carry out similar assessments

The significance of stakeholder involvement in adaptive water management strategies

Project Coordinator Anabel Sánchez discusses BeWater, a project which seeks to make society an active participant in water adaptation to global change



Can you outline the key aims and goals of BeWater?

Future climate change projections for the Mediterranean region

indicate an increase in water scarcity, as well as increased frequency of drought episodes, floods and other extreme events, resulting in socioeconomic and environmental impacts. Meanwhile, changes in demographics and land use, such as urban expansion or the abandonment of traditional agriculture, also influence the capacity to respond to these extreme events. These combined pressures are generally referred to as global change. In the context of river basins, sustainable water management strategies leading to increased resilience of the social-ecological system of river basins are urgently needed.

Researchers and policy makers worldwide are developing different adaptation approaches and solutions. Experience demonstrates that local communities must engage with such strategies and play an active role in their development in order to maximise effective implementation. As a contribution to this transition process, the BeWater project, which began in 2013 and ends later this year, is focusing on the implementation of the adaptive water management approach at river basin scale in the Mediterranean region. In

particular, the BeWater project has involved four pilot case studies: the Tordera (Spain), Pedieos (Cyprus), Rmel (Tunisia) and Vipava (Slovenia) River Basins. These basins are representative of various Mediterranean conditions with regard to climate, topography, environment, socioeconomic and political conditions, land use and water management.

What are the main challenges to achieving sustainable water management, and how is BeWater helping to address these?

The main challenges relate to the need to face the impacts of climate and land use change, as well as the pressure on water bodies to supply water to urban areas and the development of economic activities in the basin. These pressures affect the current state of ecosystem functionality and future projections indicate this trend may increase, making populations around river basins more vulnerable and calling for urgent actions to be put in place. BeWater is addressing these challenges with a bottom-up and participatory approach to building societal resilience at river basin level, inviting local actors, public administrations and experts to share their knowledge and co-produce concrete proposals to achieve more adaptive water management practices.

What is adaptive management and how has BeWater made use of this concept?

Adaptive management can be seen as an actualisation of the integrated water management framework by including tools and approaches that enable dealing with uncertainty and complexity. BeWater has adopted adaptive management as a strategy for adaptation to global change at river basin level. We consider there is no adaptive management in water governance without participatory practices. Thus it is essential to include stakeholders in this process. BeWater has engaged local communities both in problem scoping and in problem solving, fully integrating local knowledge and aiming at feeding into management decision-making processes at all stages.

How important has the input from local partners been to the project?

The role of local actors has been central in the River Basin Adaptation Plans (RBAPs) in all cases, especially in providing input and content to the process and so contributing to fostering the transition to more resilient societies. The scientific and technical expertise of project partners meant we could elaborate methodologies to evaluate the impact of the water management options, which supported the formulation of all the needed information to maximise the performance of each RBAP.



Uniting science and society

*Local stakeholders working together with experts aim to achieve sustainable water management in order to adapt to the impacts of global change in the Mediterranean region. The framework for this collaborative effort is provided by the **BeWater** project, which seeks to promote and foster dialogue and collaboration between science and society*

BeWater is an EU Seventh Framework Programme (FP7) project that is seeking to make society an active participant in water adaptation to global change. Ending in March this year, the 3.5 year project focuses on building a co-production process between experts and local communities on the management of local water resources. This is being done through case studies of four river basins: Pedieos in Cyprus, Rmel in Tunisia, Tordera in Spain and Vipava in Slovenia (see below). Each case study has developed a specific River Basin Adaptation Plan (RBAP) based on a common approach and adapted to the specific needs of the local area.

Importantly, the local community is fully engaged through each of these case studies, as Project Coordinator Anabel Sánchez explains: 'The BeWater approach enabled mutual and multidirectional learning among the project partners, entities and actors within and between the river basins and with broader society.' Furthermore, the researchers expect that the RBAPs will act as a reference for other basins, and that the framework can potentially be scaled up to support the development of national and international guidelines.

CONTINUOUS DIALOGUE IS KEY

The project has developed an innovative approach in order to ensure effective dialogue and collaboration between experts and society. This involves a range

of participatory tools including stakeholder engagement, fuzzy cognitive mapping, and identifying water management options, all conducted in local languages, while an awareness campaign in each river basin complemented the process. For each of the case studies, a team of local scientists and experts from the consortium united with local stakeholders. Sánchez reveals that at each stage the team made a particular effort to 'clarify the scope and the objectives of the activities, as well as answering potential doubts and expectations'.

BOTTOM-UP APPROACH

Peter Suhadolnik, Coordinator of the Vipava Case Study, believes that the approach they used has been effective: 'The bottom-up approach is the most valuable tool used in the BeWater project, especially because it was used from the beginning of the project. We can with certainty and confidence say that the RBAPs were developed with the participation of society and science.' According to Suhadolnik, gathering together stakeholders from different sectors and enabling them to share knowledge and firsthand experience, as well as desires, needs, concerns and fears, has allowed the project to further develop, enabling adaptive water management in the light of global change.

Coordinator of the Rmel Case Study, Sihem Jebari, also considers BeWater's approach to be the recipe for the successful outcomes:

'Participation can create a much richer picture of the local challenges at hand, the objectives and vision for the river basin, and ways forward to achieve these objectives. Ultimately, the integration of diverse stakeholders within management discussions and decision-making processes is the best way to ensure that their perspectives, knowledge and voices are heard and integrated.'

LESSONS LEARNED

The project's participatory approach was developed and applied in all four case studies, which enables the researchers to determine whether it would be suitable for different contexts and realities. 'The BeWater experience has proven that the collaboration between science and society is possible and capable of developing a complex task such as a RBAP,' says Sánchez. The team has found from their results that the approach is suitable and flexible in addressing specific needs and challenges at river basin level.

The researchers have created a handbook documenting the lessons learned, as Sánchez highlights: 'This was produced in order to allow the replication of this process, structuring the essential findings relevant for those river basins in the Mediterranean region and beyond that need to develop a river basin adaptation plan to face the impacts of global change.'

‘The BeWater experience has proven that the collaboration between science and society is possible and capable of developing a complex task such as a River Basin Adaptation Plan’

Case studies

The BeWater approach was put into practice through four case studies in four cardinal points of the Mediterranean, each resulting in a specific River Basin Adaptation Plan built around participatory methods which allowed stakeholders to be integrated into the process

TORDERA – COORDINATOR: ANNELIES

BROEKMAN The Tordera River Basin is a forested, non-regulated river basin in the northern part of Catalonia, Spain. Some of the main challenges this area faces include land use changes and population growth increasing the amount of water consumed, as well as the decrease of river flows caused by global change. A snowball sampling methodology was used here, with stakeholders with key interests being identified, contacted and asked to indicate other stakeholders they believe should be invited to participate. This enabled the network of contacts to grow. ‘Stakeholders were identified in accordance to basic profile criteria such as field of interest, responsibilities, background and experience-based knowledge, activities developed or their role in local society,’ explains Broekman.

PEDIEOS – COORDINATOR: ELIAS

GIANNAKIS The ephemeral Pedieos River originates in the north-eastern hillsides of the Troodos mountain complex in Cyprus. At the bottom of the foothills, a dam provides flood protection, groundwater recharge and water supply for nearby communities. The river then flows into the urban agglomeration of the capital Nicosia and its adjacent municipalities. ‘Water scarcity and drought are major challenges in the Pedieos River Basin,’ explains Giannakis. ‘The stakeholders engaged in the participatory development of the Pedieos RBAP identified the quantitative and qualitative status of groundwater and surface water and the risk of flooding as major climate-water challenges.’ The RBAP includes 30 options for enhancing adaptation to climate change, namely, nature-based measures, hard engineering works and soft and managerial approaches.

VIPAVA – COORDINATOR: PETER

SUHADOLNIK The Vipava River Basin is located in the southwest of Slovenia and mostly has an impervious flysch sedimentary rock base, with the exception of the west side of the basin bordering karst. The water level of the Vipava River varies significantly due to karst surface tributaries on the western side. Before the 1970s when river regulations were introduced, floods were very common in the Vipava Valley. ‘Local stakeholders were very interested in the development of the RBAP,’ explains Suhadolnik. ‘From this perspective it was very easy to get their engagement. However, stakeholders coming from several different sectors sometimes had their own agenda and advocated content important only for their sector. In this way it was important to maintain balance between different sectors throughout the whole development process.’

RMEL – COORDINATOR: SIHEM JEBARI

The Rmel River Basin is located in eastern Tunisia in the Governorate of Zaghouan. It is an agricultural region with patches of forest and a semi-arid Mediterranean climate characterised by mild, rainy winters and hot, dry summers. The team’s first step was to collect scientific information related to climate change, land use, development of population, economic activities and potential future pressures. ‘In the second step, fuzzy cognitive mapping was applied to enable evaluating the water management options against the different challenges expressed by the stakeholders,’ says Jebari. ‘Following that, a cost-effectiveness analysis and a multicriteria analysis were conducted through participatory workshops in order to prioritise management options. Finally, the different options were grouped into bundles addressing different challenges based on their co-benefits.’

Project Insights

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CONTACT

Anabel Sánchez
Project Coordinator

T: 0034 93 5814675
E: a.sanchez@creaf.uab.cat
W: <http://bewaterproject.eu/>

PROJECT COORDINATOR BIO

Anabel Sánchez is a biologist with a Master’s in Sustainable Water Management. Working at the Centre for Ecological Research and Forestry Applications since 1996, she is a founding member of the Water and Global Change research team. She has been involved in projects aiming at quantifying carbon and water balances in Mediterranean and European forests and assessing the impacts of climate change on forest ecosystem services. She has also worked closely with forest sector stakeholders in identifying adaptive forest management strategies.



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