B-WaterSmart magazine

Enabling water-smart European societies and economies

Content
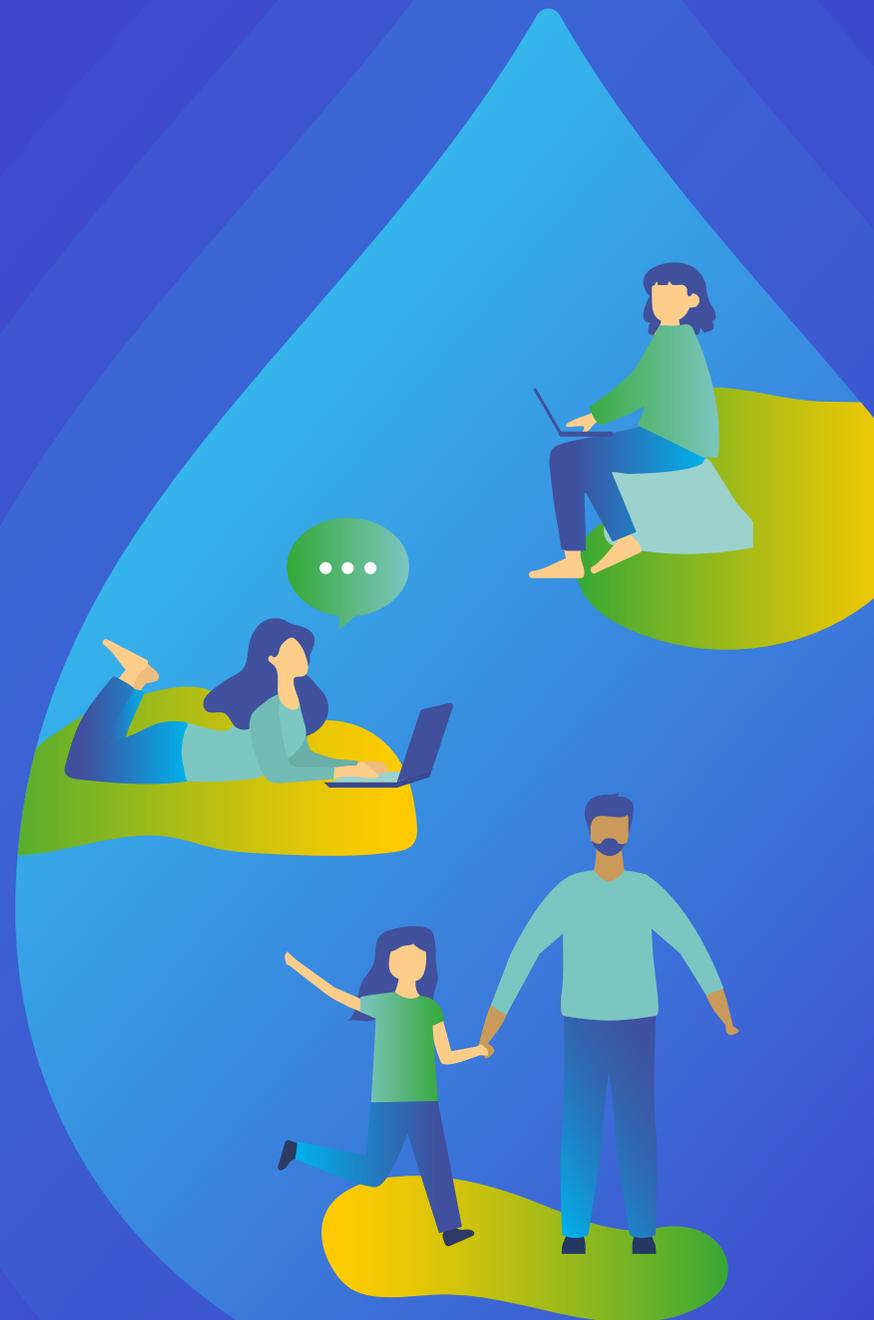
The Road so far

Two years ago we started with a lot of ambition but also somewhat concerned whether it would be possible to run a complex project with so many partners across Europe under the restrictions the pandemic situation had imposed on us. Looking back now as we are almost halfway through the project, we are happy and proud that we have succeeded to find adequate ways to enable intense and meaningful collaboration among the partners despite e.g. the limitations regarding physical meetings. By now, B-WaterSmart is actually delivering its first outputs.

Achievements

Starting with the people, we have established active local communities of practice in all our six Living Labs, and are cooperating with a couple of sister projects and other European initiatives in the water sector, especially in relation to circular economy and water smartness. As one of our first outcomes, we have delivered a definition of "water-smartness" and the first version of a framework on how to assess it, which is currently being road-tested by our Living Lab members. The developing and dimensioning of most technology solutions in the six Living Labs has been concluded, and the majority is now in the process of constructing and starting-up the pilots for the coming demonstration phase. With regard to the software solutions and tools, we have developed a FIWARE-based interoperability framework (which is key for the interaction among the tools), and we are about to release the first version of two toolkits: one for water cycle modelling and assessment, the other one for monitoring, negotiation and decision support. Last but not least, we have expanded the Water Europe Marketplace for Circular Economy: a flexible platform to share and find innovative solutions to enable or support Circular Economy.

You will find more information about most of these activities in this magazine. If you want to receive regular updates about our progress and new results, please visit our website and subscribe to the project newsletter.

Enjoy the read!

David Schwesig and Kristina Wencki
Project Coordinators of B-WaterSmart

Water-smart technologies and concepts in B-WaterSmart

Work-Package 2 of B-WaterSmart is the hub for all technologies considered in the project. It is the playground where innovative solutions are developed, tested, and improved to be ready for providing water-smart services to society at large. Professor Tone Merete Muthanna and Associate Professor Franz Tscheikner-Gratl from the Norwegian University of Science and Technology, Department of Civil and Environmental Engineering are leading the Work-Package (WP) within the project.

Tone Merete Muthanna and Franz Tscheikner-Gratl | Norwegian University of Science and Technology

What are the main outcomes you are expecting from your WP?

Our WP delivers 15 technologies that in combination with the results from WP3 (water-smart applications and data) offers water-smart solutions that will help us reduce the consumption of freshwater in Europe and beyond. Several of the technologies are already available. They are ranging from storm water and wastewater reuse, energy, and resource recovery to innovative sensor techniques.

"Water is a connector and offers solutions to the issues and challenges we as a society have to address with urgency in solving the climate adaption challenges we are facing."

Professor Tone Merete Muthanna
WP2 leader Norwegian University of Science and Technology, Department of Civil and Environmental Engineering

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To whom are those technologies of interest to?

The technologies address a very wide range of water-related challenges in varying climate conditions. We are developing smart water meters for individual households, integrated water reuse technology solutions between different industries, and biogas production from decentralized waste water treatment plants, among other things. These technologies are of interest to individuals and businesses as well as utilities and service providers.

What do you enjoy most when working for the B-WaterSmart project?

The wide range of different technologies allows for great opportunities to learn something new, even for us experts in the field. The collaboration of the over 30 project partners between engineering, social science, and human behaviour experts that is needed for successful technology transformation is one of the things we really enjoy too.

Which aspects of the B-WaterSmart project can affect the (water-) future in a positive way and how?

In addition to the new technologies and tools, the most important contribution is a change in the mindset of each of us as to how we think about our limited water resources. Raising awareness of water related challenges is crucial, even in areas where they are not so felt and seen at the moment. Also important are the interlinked benefits in reduced energy consumption and carbon footprint that can come from water-smart solutions, also in areas without acute water stress (yet).

"**Technology without motivated people will deliver a similar result as motivated people without technology.**"

Associate Professor Franz Tscheikner-Gratl
WP2 deputy leader Norwegian University of Science and Technology, Department of Civil and Environmental Engineering

Water-smart applications and data

Work-Package 3 is the place where tools and models are developed that assess the state of water systems and design interventions to make the systems smarter and more efficient. Christos Makropoulos, Professor of Hydroinformatics at the National Technical University of Athens and principal scientist at KWR leads it.

Christos Makropoulos
| Professor of Hydroinformatics at the National Technical University of Athens and principal scientist at KWR

What are the main outcomes you are expecting from your work-package (WP)?

We are currently working on a wide range of tools for different scales of assessment and different infrastructure life cycle points (from decision making and negotiations, to design of interventions, to real time operations, to monitoring), which we will pull together in an interactive narrative that allows end users beyond the project to navigate through these tools and select the right ones for their case. Such a process is reliant on interoperability and we already have a third of our tools FIWARE compliant. I think this is really great!

"It takes much more than 'AI' to be smart – especially about water management. And it's this spirit of (technology enabled) co-creation of concepts, methods, plans and policies that I really enjoy in B-WaterSmart."

Christos Makropoulos
Professor of Hydroinformatics at NTUA and Principal Scientist at KWR

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How are the connections to the other WPs?

The WP water-smart applications and data works hand in hand with the development of hardware innovations (in WP2) and of course the Living Labs as end users of the tools we are developing (in WP1). To give an example, WP3 data analytics for improved water consumption forecasts are closely associated with the development of new smart meters in WP2 and their information is needed by WP1 stakeholders.

What/who is the target audience for your main outcomes and why?

We are developing a whole host of tools. Most are for local and regional decision makers and their advisors in smart-water management, mainly the researchers, consultants and engineers that facilitate the decision and co-creation process.

What do you enjoy most when working for the B-WaterSmart project?

It is the energy and the sense of a team. We understand each other perfectly and this brings significant added value to our stakeholders I think. And, of course, the cross-section of EU challenges addressed by this project, bridging very tangible on the ground work with methodological advances of significant transferability potential, is excellent.

Which aspects of the B-WaterSmart project can affect the (water-) future in a positive way?

Well, we do spend time and effort to really understand what a smart water future can (and should) be. I think this common language and the shaping of a common vision around water-smartness is something that can have profound impacts. Empowered by the tools, processes and methods we develop, it should make a real difference, both in the medium term but also more strategically.

Water-smart society

How water is valued determines how water is managed and shared. If we neglect its value, we risk mismanaging this finite and irreplaceable resource.

The United Nations World Water Development Report 2021 "Valuing Water" (UN, 2021) highlights that "the different values of water need to be reconciled, and the trade-offs between them resolved and incorporated into systematic and inclusive planning and decision-making processes".

Understanding and assessing the value of water and incorporating it into decision-making are fundamental to achieving sustainable and equitable water resources management and the Sustainable Development Goals (SDGs) of the United Nations' 2030 Agenda for Sustainable Development.

The UN report groups current methodologies and approaches to the valuation of water into five interrelated perspectives: valuing water sources, in situ water resources and ecosystems; valuing water infrastructure for water storage, use, reuse or supply augmentation; valuing water services, mainly drinking water, sanitation and related human health aspects; valuing water as an input to production and socio-economic activity, such as food and agriculture, energy and industry, business and employment; and other sociocultural values of water, including recreational, cultural and spiritual attributes.

According to the UN report, the way forward is to develop common approaches, but also to prioritize improved approaches to compare, contrast and merge different values, and to incorporate fair and equitable conclusions into improved policy and planning.

In this direction, the B-WaterSmart project (specifically through Work-Package (WP) 6), aims at providing an assessment framework to support multi-stakeholder and strategic decision-making towards the transition to a water-smart society that recognizes multiple values and facilitates the active participation of a varied set of actors.

The concept of a water-smart society is rather new and has not been much elaborated in water governance research, nor among practitioners.

Therefore, to achieve the vision of being a water-smart society, in which the values of water are recognized and reconciled, it requires a definition and the operationalization into an applicable water smartness assessment framework.

The first ambition of WP6 prior to the development of the framework has been to define the concept of "being a water-smart society".

Based on an extensive literature review and insights from the six Living Labs (LLs) actively involved in the project, the following definition of water-smart society is endorsed:

Societies are water-smart when they generate societal well-being via sustainable management of water resources. In water-smart societies, well-informed citizens and actors across sectors engage in continuous co-learning and innovation to develop an efficient, effective, equitable and safe circular use of water and the related resources. This is achieved by adopting a long-term perspective to ensure water for all relevant uses, to safeguard ecosystems and their services to society, to boost value creation around water, while anticipating change towards resilient infrastructure.

This definition puts the three dimensions of sustainability to the fore, while stating that sustainability is generated and always in the making. The emphasis on enabling citizens and actors to engage in continuous co-learning and innovation highlights the importance of involvement across levels and sectors. It places co-learning and innovation centrally in the definition, seeing these as crucial to achieve the radical system change required to transition from a linear to a circular economy. The long-term perspective and focus on conserving ecosystems as well as their wider benefits to society is emphasized, together with the ability to manage complex and uncertain conditions, while adapting and renewing existing infrastructures in a flexible way.

For the conceptualization of the framework, the WP6 team has reviewed tools and approaches for assessments that are relevant to the development of the B-WaterSmart framework and conducted a preliminary study of the LL owners' perspectives on the needs for and expectations of the B-WaterSmart framework. Analysis of how existing tools meet the needs of stakeholders were the basis of the preliminary concept and design of the framework, as well as the framework key features and the user requirements.

The B-WaterSmart framework key features are grounded on its taxonomy which consists of a list of selected strategic objectives. Each objective is specified by assessment criteria for them. Each criterion in turn is described with a set of metrics which will serve to assess the distance from a set target. Each strategic objective can be associated with one or more of the five dimensions of sustainability transitions: i. social, ii. environmental, iii. economic, iv. technical and v. governance.

The preliminary version of the B-WaterSmart framework consists of five strategic objectives, 17 assessment criteria and 70 metrics. This version is currently under validation by the Innovation Alliance (InAll) until September 2022. The aim is to test and refine the framework and its usability for strategic planning towards more water-smartness.

The feedback from the InAll will help to further develop the framework until February 2023. Afterwards it will be converted into a dashboard so keep your eyes open for that.

The Water Europe Marketplace for Circular Economy

The Water Europe Marketplace for circular economy is a flexible platform for finding and sharing innovative solutions and systems in the domains of water, energy, and materials that support the market uptake of innovation.

At the Marketplace, you can navigate through available technologies, products, and case studies and upload and promote your own solutions. It is also a place to get in contact with other stakeholders in the circular economy, share ideas, arrange meetings and join forces.

The Water Europe Marketplace, which was first introduced in the NextGen project and further developed in the Ultimate project, is now being expanded under the B-WaterSmart umbrella. The Marketplace will be adopted and permanently curated by Water Europe after B-WaterSmart ends.

The use of the Marketplace is free and can be cancelled at any time. For a small fee, you also can upload your own products and utilize advanced algorithms to advertise them to potential stakeholders via the Marketplace's pages.

The Water Europe Marketplace

Technologies – Discover technologies of the circular economy

Case studies – Find solutions and best practices to real-life problems

Products – Browse products, tools and services related to circular economy

Networking – Connect with stakeholders, partners, clients, and investors

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