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urban water runoff**

**WATERUN**

**Deliverable D1.1**

Co-Creation Action Plans

**Work Package 1**

Co-creation process & WATERUN Framework

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## Executive Summary

Abstract	<p>This document presents the Co-Creation Action Plan of the WATERUN project, outlining a comprehensive approach to address collaborative stakeholder involvement in the development of projects OERs. It begins with an introduction to stormwater management and the innovative approach adopted by WATERUN, highlighting the critical role of co-creation in the project's framework. The rationale for the co-creation action plan is detailed, providing definitions of key concepts and tools. The objectives of the co-creation plan are then outlined, followed by the description of the methodology used. This includes stakeholder mapping and characterisation, definition of a participation strategy, the development of concept notes for each interaction with stakeholders and the implementation of the action plan. The results section presents outcomes of stakeholder mapping and characterisation in Santiago de Compostela, Aarhus, and among international key actors, detailing participation strategies and design milestones of each of the OERs/KER of the project. Following this, the concept notes of each interaction, i.e., Local Stakeholder Board (LSB) in Santiago and in Aarhus, International Stakeholder Board (ISB), Virtual Intercity Meetings, and exchange LSB-ISB meetings, are presented. These concept notes describe each of the sessions, including objectives, target audience, preliminary agenda and expected results. The document also presents the co-creation activities that took place until February 2024 in Santiago de Compostela and Aarhus, highlighting outcomes and lessons learned from local stakeholder board sessions.</p>
Keywords	Co-creation plan, stakeholder involvement, used-centred design

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## 1 INTRODUCTION

### 1.1 Novel challenges for urban stormwater management

Diffuse water pollution in urban areas remains a significant global environmental concern. It involves the movement of dissolved or particulate pollutants linked to various land uses or activities, entering urban water catchments through precipitation, infiltration, or runoff processes from diverse urban surfaces. This pollution can have adverse effects on both the environment and human health. Currently, 38% of EU surface water bodies are impacted by diffuse pollutants, with polycyclic aromatic hydrocarbons (PAHs) and heavy metals being among the most concerning contaminants. The proliferation of microplastics, whose sources, distribution, and impacts in urban environments are not yet fully understood, adds to the complexity of managing health risks associated with diffuse pollution. Climate change exacerbates the situation further by causing extreme weather events like floods and droughts.

Addressing the management of rainwater and its associated diffuse pollution is a key objective of the proposed revision to the European Directive on urban wastewater treatment, which was introduced to parliament in October 2022. The Council and the European Parliament's negotiators reached a provisional political agreement on the proposal to review the urban wastewater treatment directive in March 2024 (Council of the EU, 2024).

The new standards aim to decrease direct emissions of dissolved pollutants, litter, and microplastics into water bodies, which are often carried by urban runoff. It is anticipated that these new regulations will result in a 9% reduction in microplastic emissions.

Among various requirements, Member States are obligated to:

- 1) establish locally integrated urban wastewater management plans to tackle pollution from rainwater, urban runoff, and stormwater overflow.
- 2) promote the reuse of treated wastewater from all urban treatment plants,
- 3) identify risks posed by urban wastewater discharges,
- 4) ensure competent authorities monitor pollution levels, pollutant concentrations, and microplastic presence (Council of the European Union, 2022)

It can be foreseen that the revision of the directive will cause novel challenges for key sector actors responsible for the compliance of the updated regulatory framework.

### 1.2 The WATERUN approach

The global aim of WATERUN is to develop an innovative methodology and infrastructure to contribute to the implementation of urban water runoff (UWR) management plans in cities based on the Water-Sensitive Urban Design (WSUD) concept. As such, WATERUN exploitable results will support practitioners in Member States to comply with up-coming changes to the directive and corresponding new challenges in the context of UWR management. More precisely, WATERUN contributes to the development of the following solutions:

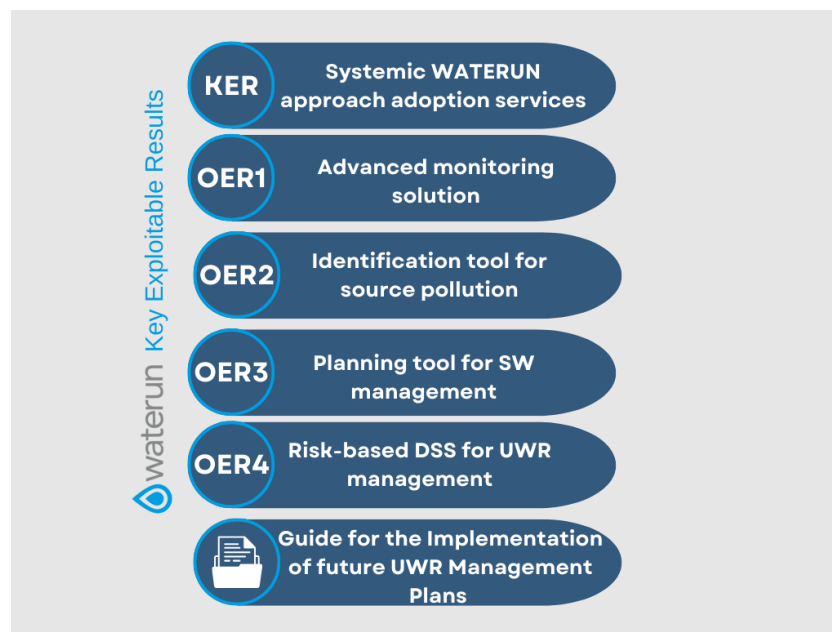


Figure 1 WATERUN Key Exploitable Results

**KER:** The **systemic WATERUN approach** adoption services comprises all or part of the products/services accounted as OERs. The corresponding deliverable is “D5.6 Guidance of WATERUN UWR management methodology”. This guidance represents the description of the WATERUN KER and will contain the working procedures and the implementation protocols of the novel tools developed in WATERUN.

**OER1:** A **portable monitoring system** designed to detect real time the presence of microplastics and PAHs *on-site*. This tool enables real-time monitoring and assessment of microplastic and PAH concentrations in runoff water, facilitating prompt decision-making. Its portability allows for field sampling and immediate analysis, eliminating the need for complex qualifications and reducing costs. Additionally, it includes a comprehensive sampling and analysis guide for easy data interpretation.

**OER2:** The **CleanCityCover** Application is a solution aimed at pinpointing key sources of diffuse pollution carried by stormwater into urban areas. By identifying these sources, the application enables the formulation of proactive measures to mitigate pollutants, thereby reducing their impact on urban environments.

**OER3: MUST-B** is an innovative approach designed to optimise the utilisation of existing collectors and treatment capacities for contaminated runoff water. This method strategically uses current infrastructure while harnessing the potential of green infrastructure for water management, preventing the discharge of untreated wastewater during heavy rainfall events.

**OER4:** A **decision support system** grounded in health and environmental risk assessment principles. Leveraging the Storm Water Management Model (SWMM), this software facilitates the planning and reclamation of stormwater while addressing potential health and environmental risks. It detects various pollutants in runoff water, offering insights into water quality, and incorporates a proactive warning system based on historical data to plan prevention and mitigation measures effectively. This tool not only evaluates and mitigates risks associated with stormwater reuse, but also aids in selecting suitable green infrastructure for project implementation areas. In addition, the WATERUN project

provides the framework for the design and implementation of **green infrastructure** for diffuse pollution mitigation from UWR in Santiago, as well as the optimisation of the performance of the green infrastructure implemented in Santiago and Aarhus CS to increase their removal efficiency (WP4). Furthermore, in the framework of WP1, a WATERUN Toolbox will be prepared to present the different KERS and OERS in a systematic way.

The following table shows how key articles of the Directive relates to a particular WATERUN solution:

*Table 1: Relationship between the Article of the Directive and the WATERUN Solutions (OERs).*

Key Objectives/Articles from the proposed reviewed Directive	Corresponding WATERUN Solutions
<p><b>Article 21:</b> Member States shall ensure that competent authorities monitor pollution from urban runoff and stormwater overflows, pollutant concentrations and loads at the outlets of urban wastewater treatment plants, and the presence of microplastics.</p>	<p><b>OER1:</b> Advanced Monitoring Solution</p>
<p><b>Article 22:</b> Member States shall submit a data set containing the information collected in accordance with Article 21 and the results of the corresponding tests.</p>	
<p><b>Article 5:</b> To establish locally integrated urban wastewater management plans to combat pollution from rainwater (urban runoff and storm water overflow).</p> <ul style="list-style-type: none"> <li>• A detailed description of the network of collecting systems, the urban wastewater and urban runoff storage capacities of that network and the existing urban wastewater treatment capacities in case of rainfall.</li> <li>• A dynamic analysis of the urban runoff flows and wastewater in case of rainfall.</li> <li>• Objectives for the reduction of pollution from storm water overflows and urban runoff rainfall based on the use of hydrological, hydraulic and water quality models.</li> <li>• Measures to be taken to achieve the objectives.</li> </ul>	<p><b>OER2:</b> CleanCityCover Application</p> <p><b>OER3:</b> MUST-B</p> <p><b>KER/D5.6:</b> Guidance of WATERUN UWR management methodology</p> <p><b>WP4</b> Output: green infrastructure</p>
<p><b>Article 15:</b> Member States are required to systematically encourage the reuse of treated wastewater from all urban wastewater treatment plants.</p>	<p><b>OER4:</b> DSS for risk-based WSUD (Water sensitive urban design)</p>
<p><b>Article 17:</b> Member States will have to set up a coordination structure between the authorities responsible for public health and urban wastewater treatment. This structure will determine the parameters to be monitored, as well as the frequency and method to be applied.</p>	
<p><b>Article 18:</b> Member States shall identify the risks caused by urban wastewater discharges to the environment and human health.</p>	

1In combination, these tools will provide a basis for the development and application of Systemic WATERUN approach adoption services – the Key Exploitable Result (KER) of the project. These services can be understood as a set of integrated engineering and blueprint services for the deployment of the

WATERUN methodology as a holistic technological solution and its industry adoption in the changing context of the creation of integrated urban wastewater management plans.

### 1.3 The role of Co-Creation in the WATERUN project

A key objective of Work Package 1 of the WATERUN project is “to foster an efficient and multidisciplinary participation in the decision-making process, while analysing and selecting the most suitable preventive and mitigation measures to tackle diffuse pollution in Santiago and Aarhus through a holistic perspective, ensuring complete comprehension of the environmental, social, economic and political dimensions”.

This objective is based on the notion that this kind of new approach for crafting UWR management plans should be embraced from a multidisciplinary perspective, considering the insights, knowledge, and skills of various important stakeholders. These stakeholders include water utilities, public authorities, water regulators, water engineering firms, the research community, and citizens. To achieve this, the WATERUN approach has been designed from the outset to include a collaborative process involving these key stakeholders in the development, implementation, and validation of project outcomes and findings. These efforts should culminate in the implementation of so-called Co-Creation Action Plans. These plans are an integral part of WP1 as can be seen in the visual representation of WP1 below:

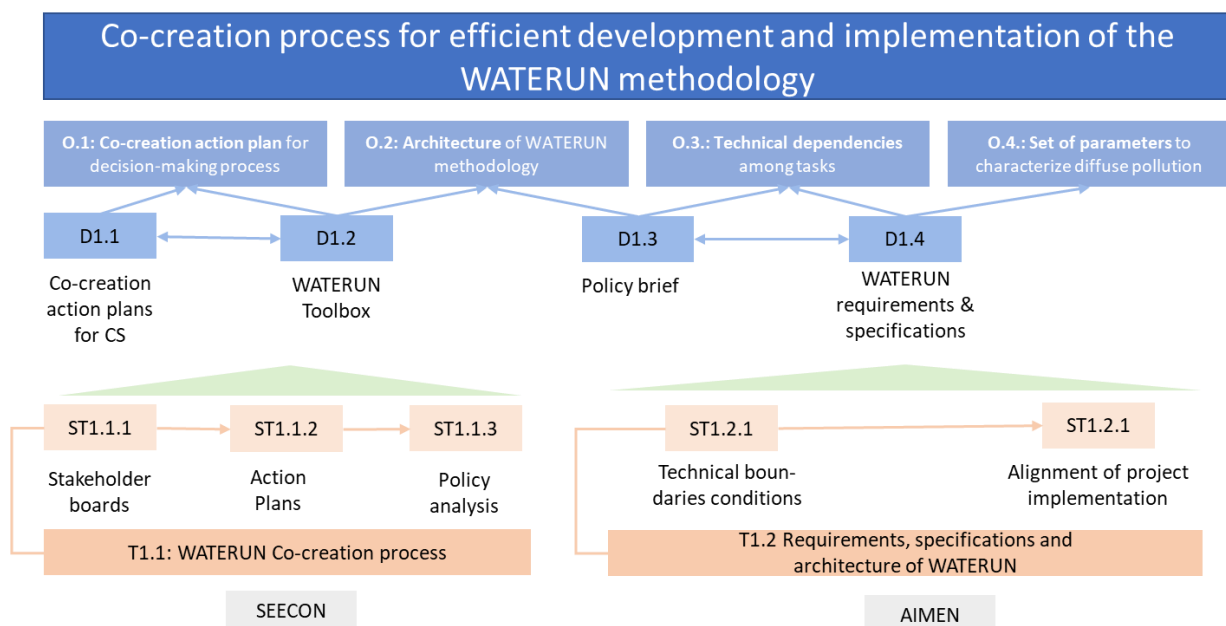


Figure 2 Visual Summary of Work Package 1

Hence, WATERUN is putting a strong emphasis on co-developing the above-mentioned exploitable results together with a representative sample of the corresponding stakeholders in the context of a systematically facilitated co-creation process. The aim of the present document is to consolidate the conceptual framework for this approach considering the preliminary results from the implementation of the same throughout the first two years of project implementation.

## 2 RATIONALE OF CO-CREATION ACTION PLAN

### 2.1 Definition of Key Concepts

The purpose of applying Co-Creation approaches in the framework of the WATERUN project is to contribute to the movement of the WATERUN Solutions along the Technology Readiness Levels TRL scale. It is essential to consider the expected Technology Readiness Level (TRL) of the WATERUN Solutions at the end of the project. As outlined in the Description of Work (DoW), WATERUN WP1 was structured to validate and demonstrate solutions in a real-world setting, aligning with TRL 5-6. Against this backdrop, Co-Creation methods are applied to help WATERUN Innovators to push their solutions up the TRL scale considering end-user and key stakeholder feedback. The hypothesis behind the choice to apply a Co-Creative approach is that through the consideration of aspects related to the optimisation of *Product-Market-Fit*, *Innovation* and *User-Friendliness* as well as aspects related to the reduction of risks linked to *Desirability*, *Feasibility* and *Viability* early in the process, higher TRLs can be reached sooner and more sustainably.

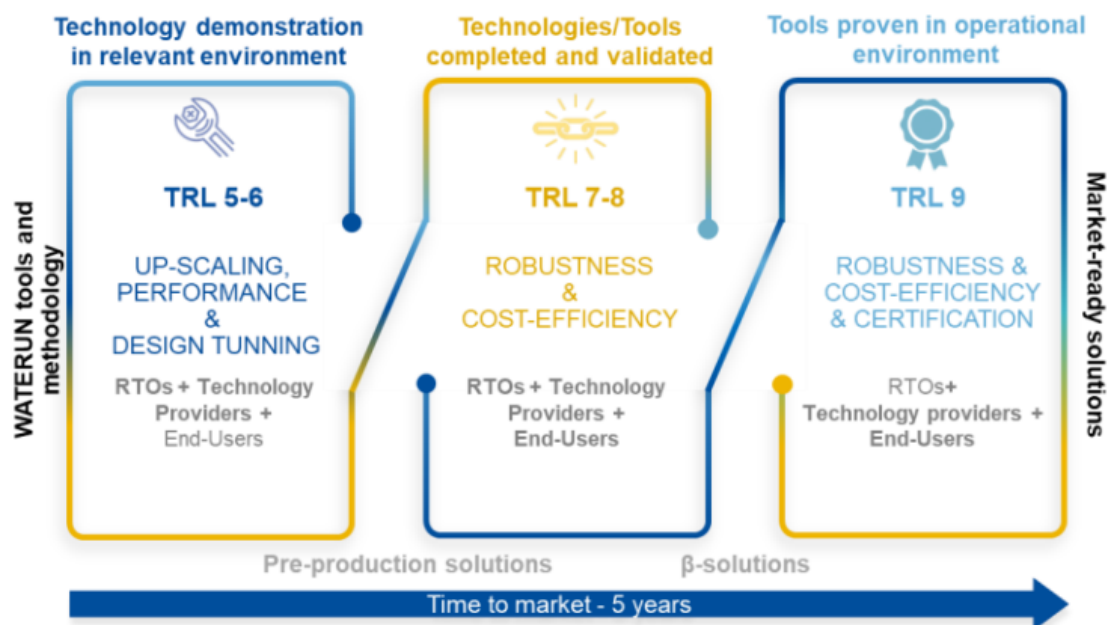


Figure 3 Evolution path beyond WATERUN project

WATERUN uses the following definition of co-creation as a starting point:

*"[Co-creation describes] an active, creative and social process, based on collaboration between producers and users, that is initiated by the firm to generate value for customers" (Roser et al., 2009).*

As stated in the DoW, the co-creation process is based on the principles of design-thinking, where the user is at the centre of the development process. Design Thinking involves stages such as empathising with users, defining problems, ideating solutions, creating prototypes, and testing them. This process benefits from diverse perspectives, ensuring a comprehensive understanding of the issues. Co-Creation supports this by involving stakeholders, in particular customers, in the design process. This ensures that solutions are practical, user-friendly, and developed with direct input from those who will use them. Combining these methods helps us create more effective and sustainable solutions by leveraging collective insights and experiences.

In business research literature, the need for co-creative approaches is mainly driven by the notion that the involvement of end-users and stakeholders during R&D processes can help to:

- optimise market-product-fit, innovation/added value and user-friendliness of new products/services; and
- reduce risks related to desirability (customers are interested), feasibility (the solution provider can build and deliver as planned) and viability (the solution provider can earn enough money to recover costs or create profits) (David J. Bland & Alexander Osterwalder, 2019).

**Optimise market-product-fit, innovation and user-friendliness:** Within WATERUN, these Co-creation methodologies are applied to support the development of the WATERUN solutions in three main areas:

- 1) **Product-Market-Fit:** Co-creation enables businesses to gain deep insights into the needs, preferences, and pain points of their customers, allowing them to develop products and services that are more closely aligned with market demand (Prahalad & Ramaswamy, 2004).
- 2) **Innovation:** Co-creation fosters innovation by tapping into the collective intelligence and creativity of diverse stakeholders, including end-users, employees, and external partners. By involving end-users in the design and development process, companies can benefit from fresh perspectives, novel ideas, and unique insights that may not have been apparent otherwise (Dobrev, 2016).
- 3) **User Friendliness and Time-To-Market:** Co-creation facilitates greater acceptance and adoption of new products and services among end-users. By involving them in the development process from the outset, companies can ensure that the final offerings meet their expectations, address their needs, and are intuitive to use (Piller et al., 2011).

In addition, Co-creation can strengthen relationships between companies and their customers, leading to greater loyalty, trust, and brand advocacy (Prahalad & Ramaswamy, 2004). The table below summarises the concepts and links them to key guiding questions to be answered through the WATERUN co-creation activities.

*Table 2: Guiding Questions related to Product-Market-Fit, Innovation & User Friendliness:*

Concept	Definition	Key Guiding Questions
Product-Market-fit	The extent by which a service/product is aligned with market demand, with a special emphasis on the needs and demands of the end-user.	To what degree are the WATERUN KER/OERs aligned with market demand? How can the Product-Market-Fit be improved?
Innovation & added value	The extent by which a new solution is improving the way end-users are solving problems in comparison to existing alternatives.	To what degree are the WATERUN KER/OERs innovative i.e., adding value to the end-user's professional lives? How can the level of innovation be increased?
User friendliness	The extent by which a new solution is tailored to the preferences, habits, resources and capabilities of the end-users enhancing/improving the user experience as much as possible.	To what degree are the WATERUN KER/OERs user friendly? How can user friendliness be increased?

**Reduce desirability, feasibility and viability risks:** Testing business ideas is mainly about testing “business hypotheses” defined as the assumptions revolving around the desirability, feasibility and viability of an idea. Within the WATERUN Co-Creation component, the basic idea is to provide the WATERUN Innovators opportunities to validate their hypotheses with potential end-users. This is done to help Innovators to reduce risks related to the desirability, feasibility and viability of their initial idea. The table below summarises the concepts and links them to key guiding questions to be answered through the WATERUN co-creation activities.

*Table 3: Guiding Questions related to Feasibility, Desirability and Viability:*

Concept	Definition	Key Guiding Questions
Feasibility	Infrastructure risk: Ability to effectively handle, expand, or obtain crucial resources (such as technology, intellectual property, branding, etc.), crucial activities, or essential partnerships.	Is the market uptake strategy for the corresponding WATERUN Innovation feasible considering WATERUN Innovator’s or its exploitation partner’s abilities and resources? How can related risks be minimised?
Desirability	Market risk: Ability to connect with, attract, and keep the desired customer base.	Is the value proposition of the corresponding WATERUN Innovation addressing customer jobs, pains and gains adequately and in a desirable manner? How can related risks be minimised?
Viability	Financial risk: Ability to produce enough income to surpass its expenses, related to its revenue streams and cost structure.	Does the market uptake strategy of the corresponding WATERUN Innovation enable financial viability (in the long run)? How can related risks be minimised?

### 2.1.1 Co-Creation Tools

Within the framework of the WATERUN project, SEECON uses tools suggested by Osterwalder *et al.* for “Business Model Generation”<sup>1</sup>, “Value Proposition Design”<sup>2</sup> and “Testing Business Ideas”<sup>3</sup> among others as a basis to develop co-creative workshop methodologies that help the WATERUN Innovators to interact meaningfully and in a productive way with potential end-users. To achieve this, we apply proven tools from user-centric design approaches and adapt them to make them more interactive and accessible for stakeholders and potential end-users. To establish a direct link to WP6 exploitation activities, we roughly follow the process of “Business Model Generation” (Yves Pigneur & Alexander Osterwalder, 2010). The tools that are applied are mainly derived from the tools suggested in the same publications as well as Bland and Osterwalder’s experiments for “Testing Business Ideas” and complemented with additional proven innovation approaches, where needed (David J. Bland & Alexander Osterwalder, 2019).

<sup>1</sup> A. Osterwalder & Y. Pigneur (2010): Business Model Generation. John Wiley & Sons, Inc.

<sup>2</sup> A. Osterwalder et al. (2014): Value Proposition Design. Online Publication. URL: <https://www.strategyzer.com/library/value-proposition-design-2>. Retrieved: 12.03.2024.

<sup>3</sup> Bland & Osterwalder (2020). Testing Business Ideas. John Wiley & Sons, Inc.

*Table 4: Co-Creation Tools (examples) and corresponding Business Model Canvas Elements:*

Business Model Canvas Element (Osterwalder & Pigneur, 2010)	Corresponding Co-creation Tools (Bland & Osterwalder, 2020 and others)
Customer Segments and Value Proposition	<ul style="list-style-type: none"> <li>• Value Proposition Canvas</li> <li>• Value &amp; Empathy Map (including Customer «Pains and Gains»)</li> <li>• Customer Interviews, Discovery Surveys &amp; User Personas</li> <li>• Clickable Prototype, Feature Stub, Buy a Feature &amp; Product Box</li> <li>• Data Sheets, Brochures &amp; Storytelling</li> <li>• Experiments, Test and Learning Cards</li> <li>• A Day in the Life</li> </ul>
Channels and Customer Relationships	<ul style="list-style-type: none"> <li>• Partner &amp; Supplier Interviews</li> <li>• “What if” Questions</li> <li>• Four Actions Framework</li> <li>• Customer Journey Maps</li> </ul>
Key Activities, Key Resources and Key Partners	<ul style="list-style-type: none"> <li>• Visual Storytelling, Storyboards &amp; Flowcharts</li> <li>• SWOT assessments</li> <li>• Letters of Intent</li> <li>• Expert Stakeholder Interviews</li> <li>• Exploitation Scenarios</li> <li>• Partnership Canvases</li> </ul>
Cost Structure and Revenue Streams	<ul style="list-style-type: none"> <li>• Business Model Prototypes</li> <li>• Scenario-guided BM Design</li> <li>• Mock Sale &amp; Buy a Feature</li> </ul>

It is important to note that this is conceived as an iterative process, with relatively high initial uncertainty levels and the final selection of the tools may vary depending on the needs of the WATERUN innovators as well as the target audience (David J. Bland & Alexander Osterwalder, 2019). Hence, the list of tools presented above is not exhaustive. The application of these tools in the framework of the WATERUN is to be planned in the Co-Creation Action Plan described in the next section.

### 3 OBJECTIVES OF THE CO-CREATION ACTION PLAN

Based on the project design described in the DoW, the key objective for the Co-Creation Action Plan can be formulated as follows:

*“To outline and plan when and how stakeholders will accompany the development of the WATERUN solutions, providing the stakeholder’s view of the challenges, the problems, their needs and wants, so the solutions a) do respond to their expectations and b) are developed considering opportunities to optimise market-product-fit, innovation and user-friendliness as well as taking into account the risks related to desirability, feasibility and viability.”*

Consequently, WATERUN plans to foster collaboration between WATERUN Innovators and Stakeholders through various co-creation events, facilitating engagement and feedback exchange to enhance the development and implementation of the WATERUN Solutions.

Against this backdrop, WATERUN proposes to establish two Local Stakeholder Boards (LSB), one International Stakeholder Board (ISB) in addition to at least two opportunities for Exchange between LSB and ISB (LIE) Relationship between the Article of the Directive and the WATERUN Solutions (OERs) and three Virtual Inter-City Meetings (VIM) meetings. Correspondingly, the objectives of each of these platforms are formulated below:

**Local Stakeholder Boards (LSB):** Each EU-Based WATERUN Case Study (Aarhus and Santiago de Compostela) is accompanied by a board of local stakeholders and potential end-users. These LSB are designed to provide a platform for productive dialogue between the WATERUN Innovators and local stakeholders as well as potential end-users with the aim of providing relevant inputs on the market-product-fit, innovation/added value and user-friendliness of new products/services, as well as ensure the sustained use of the WATERUN products and services tailor-developed for their needs.

**International Stakeholder Board (ISB):** In addition, an International Stakeholder Board comprised of relevant associations, platforms and networks, regulators, policy makers, and citizen representatives is established with the aim of stimulating exchange with additional European and international experts, who can give us their feedback on the market-product-fit, innovation/added value and user-friendliness of new products/services (knowledge exchange level).

**LSB-ISB Exchange (LIE):** Virtual meetings between both LSB and the ISB are organised to integrate the common interests and share the experiences enabling the identification and implementation of best measures to manage UWR.

**Virtual Inter-city Meetings (VIM):** In addition, virtual meetings between the two EU-based CS cities are organised to seek complementarities between both CS and enrich co-creation processes.

Each of these different types of stakeholder engagement events shall be aligned and applied in accordance with the WATERUN Innovator’s research & development plans for their corresponding OERs. This shall ensure that WATERUN Innovators have the opportunity to interact with potential end-users and key stakeholders at the right time and to an adequate extent.

## 4 METHODOLOGY

To achieve the above-stated objectives, the following methodology is being implemented:

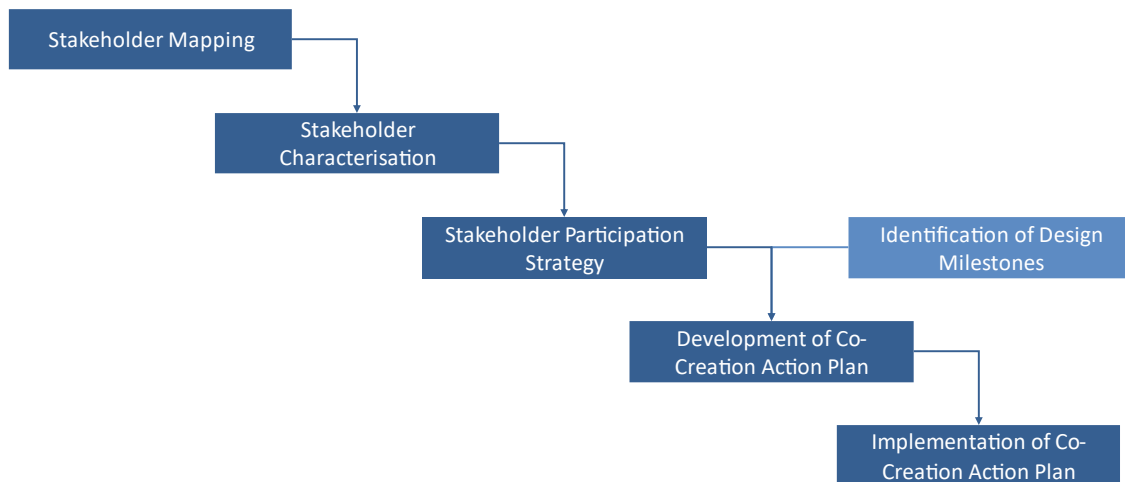


Figure 4 Co-Creation Action Plan task flow diagram

The following sections describe each methodological step in detail.

### 4.1 Stakeholder Mapping

The first step is to conduct a stakeholder mapping along the UWR management cycle, indicating which stakeholders should be involved in the decision-making process. This stakeholder mapping exercise is established by conducting an exploratory desk research to be complemented with inputs from WATERUN project partners, particularly the partners mainly involved in the case studies (AIMEN, UDC, VIAQUA, AU and AV). To achieve this, WATERUN partners are tasked to fill in the following mapping template designed to identify key actors involved in key steps of the UWR management cycle:

0. Author Contact/Data				
What is your name?			How can I contact you?	
1. Rapid Mapping				
Who are the three most crucial / important stakeholders that should be invited into the WATERUN Stakeholder Board?				
Organization Name	Name of Contact in said Organization (if available)	What is its role in the UWR decision making & management process?	Through whom should we contact them?	Any other comments regarding this organization?

(Continuation on next page)

2. Systematic Mapping						
Phase	Step	Receiving Sealed Surfaces	Transport to WWT/Discharge	Treatment	Discharge	
	Process	Rain/Hail/Snow falls down on surfaces and the resulting water gets collected in some way or form	The collected precipitation is channeled into a sewer system (either separated or combined; if separated, the next step can be skipped)	The water is received by the local water treatment facility and treated for safe discharge or reuse (skip this part if your case has a separated sewer)	The treated (collected) runoff water gets channeled into surface waters like rivers, lakes, the sea...	Eventually, the treated runoffwater is contributing to the replenishment of groundwater sources
Planning	Infrastructure Components	Public/private roofs, streets, parking lots, etc.	Sewer network from point(s) of collection to Waste Water Treatment Plant/to discharge	Waste Water Treatment Plant	Surface Water	Groundwater
	Policymaking: Who is in charge of making decisions for corresponding policies					
	Regulation: Who is in charge of enforcing the policy decisions					
	Implementation: Who is in charge of implementing the policy decisions					
	Budgets: Who is in charge/in control of relevant budgets?					
Operation	Operation & Maintenance: Who is in charge of O&M?					
	Monitoring & Evaluation: Who is in charge of M&E (e.g. binding environmental standards)?					
	Impacts: Who else is affected by the decisions made about UWR?					
Secondary Stakeholder						
2. Systematic Mapping						
Phase	Step	Reuse				
	Process	Agricultural Use	Industrial Use	Domestic Use	Public "leisure" use	Environmental Use
Planning	Infrastructure Components	Irrigation Infrastructure	Industrial Production Infrastructure	Households	Lakes, Rivers, Swimming Pools, etc. that are of value for people's leisure	"Nature" i.e. Flora & Fauna (sensitive to water quality)
	Policymaking: Who is in charge of making decisions for corresponding policies					
	Regulation: Who is in charge of enforcing the policy decisions					
	Implementation: Who is in charge of implementing the policy decisions					
	Budgets: Who is in charge/in control of relevant budgets?					
Operation	Operation & Maintenance: Who is in charge of O&M?					
	Monitoring & Evaluation: Who is in charge of M&E (e.g. binding environmental standards)?					
	Impacts: Who else is affected by the decisions made about UWR?					
Secondary Stakeholder						

Figure 5 Stakeholder Mapping Tool

## 4.2 Stakeholder Characterisation

Once a long list of potential stakeholders is created through the mapping exercise, a more detailed analysis of the (initial) value proposition and corresponding key user segments of each WATERUN solution is conducted to determine the most relevant key actors to involve in its particular co-creation process. These are characterised according to their profile as potential end-users and or affected stakeholders to inform the subsequent stakeholder participation strategy.

Table 5: Stakeholder Characterisation Tool (1/2):

WATERUN Solution	Potential end-user	Use case (How will the user use the solution?)	Who among the WATERUN partners has the contact	Who is the point of contact for the end-user	Next Steps
OER1: Portable monitoring system					
OER2: CleanCityCover Application					
OER3: MUST-B					
OER4: Decision support system					

## 4.3 Stakeholder Participation Strategy and Identification of Design Milestones

Based on the results of the stakeholder characterisation, a participation strategy is conceived for the two LSBs and the ISB. This participation strategy establishes the extent to which the identified and characterised stakeholders should be involved in the co-creation activities. Accordingly, the stakeholders are grouped into four groups: Core group, regular board members, visitors & invitees and secondary stakeholders. For each of these groups a general participation strategy is formulated, to be adapted on a case-to-case basis, if needed:

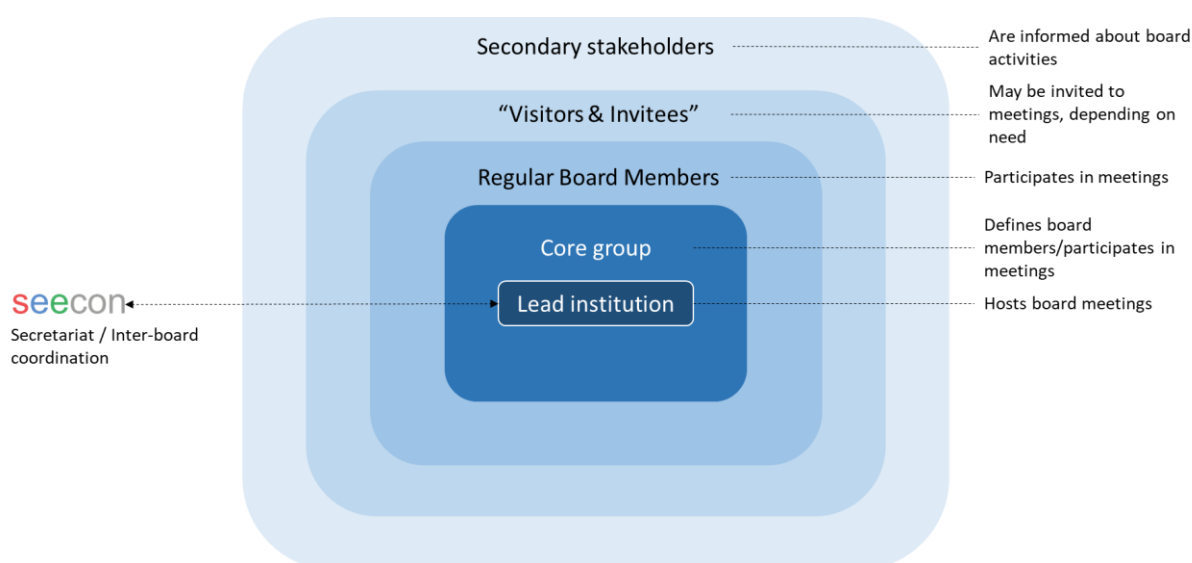


Figure 6 Visualisation of the Stakeholder Participation Strategies

#### 4.4 Development of Co-Creation Action Plan

[illegible]

As it can be appreciated in Figure 9, the action plan ensures that all OERs are discussed in the framework of a co-creation activity two times, and, includes times to present and discuss other relevant topics and products, such as regulation, the WATERUN Toolbox and the Policy Brief.

*Table 6: Co-Creation Activity Concept Note:*

Key Aspect	Description
Objective of the co-creation workshop	
Target audience	
Guiding questions to be answered	
Draft agenda	
Key Outputs	

## 4.5 Implementation of Co-Creation Action Plan

Once these key steps are defined and validated with WATERUN project partners, the plan is implemented. In this process, the concept notes are used as a basis for the development of a detailed workshop design, corresponding communication materials (official invitations to stakeholders, etc.) and the organisation of the event logistics. Feedback gathered from stakeholders and corresponding recommendations and conclusions are documented and synthesised in an internal report for the WATERUN Innovators and a shorter, more general external report for all four groups of the LSB.

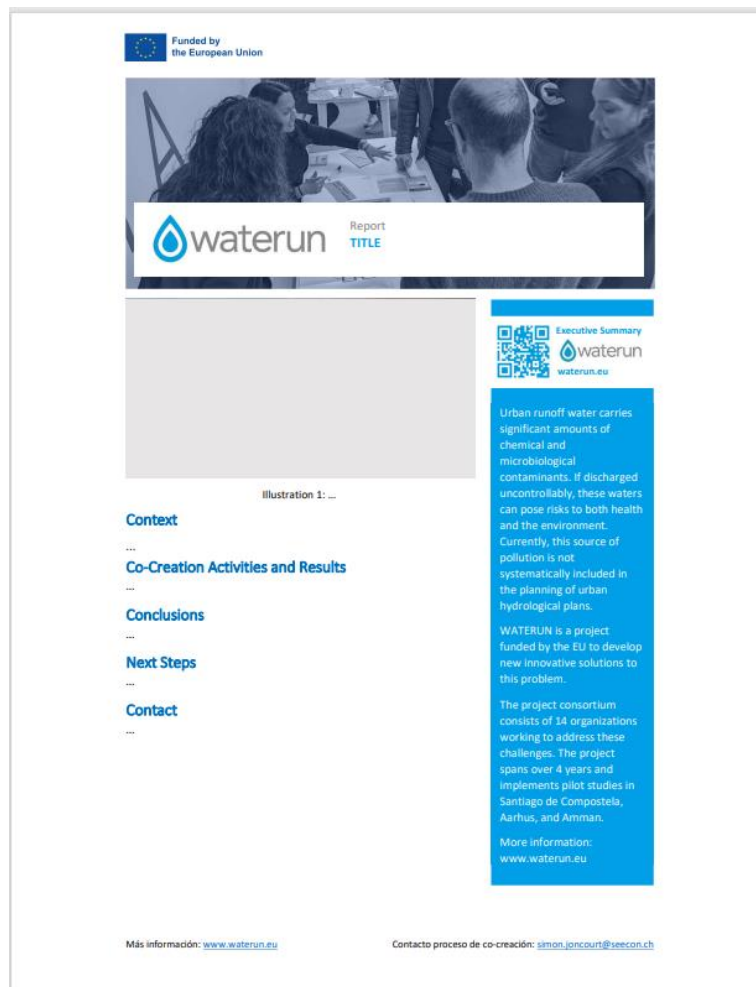


Figure 8 Template for the Co-Creation Meeting Reports

## 5 RESULTS

### 5.1 Stakeholder Mapping

The stakeholder mapping along the UWR Management Cycle heralded a long-list of stakeholders. For formatting reasons, the results are presented in three separate tables for each case study, this is Santiago de Compostela and Aarhus.

#### 5.1.1 Stakeholder Mapping: Santiago de Compostela

Table 7: Stakeholder Mapping Santiago de Compostela (1/3):

Systematic Mapping Santiago de Compostela (1/3): Receiving Sealed Surfaces, Transport & Treatment				
Phase	Step Process  Infrastructure Components	Receiving Sealed Surfaces Rain/Hail/Snow falls down on surfaces and the resulting water gets collected in some way or form Public/private roofs, streets, parking lots, etc.	Transport to WWT/Discharge The collected precipitation is channelled into a sewer system (either separated or combined; if separated, the next step can be skipped) Sewer network from point(s) of collection to WWTP/to discharge	Treatment The water is received by the local water treatment facility and treated for safe discharge or reuse (skip this part if your case has a separated sewer)  Wastewater Treatment Plant
Planning	Polymaking: Who oversees making decisions for corresponding policies	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council
	Regulation: Who is in charge of enforcing the policy decisions	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council
	Implementation: Who is in charge of implementing the policy decisions	Aguas de Galicia at regional level ; Santiago de Compostela City Council	Aguas de Galicia at regional level ; Santiago de Compostela City Council	Aguas de Galicia at regional level ; Santiago de Compostela City Council
	Budgets: Who is in charge/in control of relevant budgets?	Municipality and Aguas de Galicia; Water utility (VIAQUA); Santiago de Compostela City Council	Municipality and Aguas de Galicia; Water utility (VIAQUA); Santiago de Compostela City Council	Municipality; Aguas de Galicia; Water utility (VIAQUA); Santiago de Compostela City Council
Operation	Operation & Maintenance: Who is in charge of O&M?	Water utility (VIAQUA); Santiago de Compostela City Council	Water utility (VIAQUA)	Water utility (VIAQUA)
	Monitoring & Evaluation: Who is in charge of M&E (e.g., binding environmental standards)?	Municipality and Aguas de Galicia; Water utility (VIAQUA); Santiago de Compostela City Council	Municipality of Santiago de Compostela Aguas de Galicia (Regional environmental government); Water utility (VIAQUA)	Municipality of Santiago de Compostela Aguas de Galicia (Regional environmental government); Water utility (VIAQUA)
Other	Impacts: Who else is affected by the decisions made about UWR?	Citizens, transport agencies; Aguas de Galicia (Xunta de Galicia); Association of companies of the industrial park (Tambre and A Sionlla)	Citizens; Aguas de Galicia (Xunta de Galicia)	Citizens; Aguas de Galicia (Xunta de Galicia)

Table 8: Stakeholder Mapping Santiago de Compostela (2/3):

Systematic Mapping Santiago de Compostela (2/3): Discharge			
Phase	Step Process  Infrastructure Components	Discharge	
		<i>The treated (collected) runoff water gets channelled into surface waters like rivers, lakes, the sea...</i> Surface Water	<i>Eventually, the treated runoff water is contributing to the replenishment of groundwater sources</i> Groundwater
Planning	Policymaking: Who is responsible for making decisions for corresponding policies	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council
	Regulation: Who is in charge of enforcing the policy decisions	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council	Municipality at local level and Aguas de Galicia at regional level; Santiago de Compostela City Council
	Implementation: Who is in charge of implementing the policy decisions	Water utility (VIAQUA); Santiago de Compostela City Council	Water utility (VIAQUA); Santiago de Compostela City Council
	Budgets: Who is in charge/in control of relevant budgets?	Municipality at local level and Aguas de Galicia at regional level; Water Utility (VIAQUA)	Municipality at local level and Aguas de Galicia at regional level; Water Utility (VIAQUA)
Operation	Operation & Maintenance: Who is in charge of O&M?	Water Utility (VIAQUA)	Water Utility (VIAQUA)
	Monitoring & Evaluation: Who oversees M&E (e.g. binding environmental standards)?	Municipality of Santiago de Compostela; Aguas de Galicia (Xunta de Galicia); Water Utility (VIAQUA)	Municipality of Santiago de Compostela; Aguas de Galicia (Xunta de Galicia); Water Utility (VIAQUA)
Other Stakeholders	Impacts: Who else is affected by the decisions made about UWR?	Citizens	Citizens, fisherman associations, river sport clubs

Table 9: Stakeholder Mapping Santiago de Compostela (3/3):

Systematic Mapping Santiago de Compostela (3/3): Reuse						
Phase	Step Process  Infrastructure Components	Reuse				
		Agricultural Use  Irrigation Infrastructure	Industrial Use  Industrial Production Infrastructure	Domestic Use  Households	Public "leisure" use  Lakes, Rivers, Swimming Pools, etc. that are of value for people's leisure	Environmental Use  "Nature" i.e. Flora & Fauna (sensitive to water quality)
Planning	Polymaking: Who is in charge of making decisions for corresponding policies	Municipality at local level and Aguas de Galicia at regional level; Aguas de Galicia (Xunta de Galicia)	Municipality at local level and Aguas de Galicia at regional level; Aguas de Galicia (Xunta de Galicia)	Municipality at local level and Aguas de Galicia at regional level	Municipality at local level and Aguas de Galicia at regional level; Aguas de Galicia (Xunta de Galicia)	Municipality at local level and Aguas de Galicia at regional level; Aguas de Galicia (Xunta de Galicia)
	Regulation: Who is in charge of enforcing the policy decisions	Municipality at local level and Aguas de Galicia at regional level; Aguas de Galicia (Xunta de Galicia)	Municipality at local level and Aguas de Galicia at regional level; Aguas de Galicia (Xunta de Galicia)	Municipality at local level and Aguas de Galicia at regional level	Municipality at local level and Aguas de Galicia at regional level; Aguas de Galicia (Xunta de Galicia)	Municipality at local level and Aguas de Galicia at regional level; Aguas de Galicia (Xunta de Galicia)
	Implementation: Who is in charge of implementing the policy decisions	Aguas de Galicia (Xunta de Galicia)	Aguas de Galicia (Xunta de Galicia)	n/a	Aguas de Galicia (Xunta de Galicia)	Aguas de Galicia (Xunta de Galicia)
	Budgets: Who is in charge/in control of relevant budgets?	Aguas de Galicia (Xunta de Galicia)	Aguas de Galicia (Xunta de Galicia)	n/a	Aguas de Galicia (Xunta de Galicia)	Aguas de Galicia (Xunta de Galicia)
Operation	Operation & Maintenance: Who is in charge of O&M?	Aguas de Galicia (Xunta de Galicia)	Aguas de Galicia (Xunta de Galicia)	n/a	Aguas de Galicia (Xunta de Galicia)	Aguas de Galicia (Xunta de Galicia)
	Monitoring & Evaluation: Who is in charge of M&E (e.g. binding environmental standards)?	Aguas de Galicia (Xunta de Galicia)	Aguas de Galicia (Xunta de Galicia)	n/a	Aguas de Galicia (Xunta de Galicia)	Aguas de Galicia (Xunta de Galicia)
Other Stakeholders	Impacts: Who else is affected by the decisions made about UWR?	Aguas de Galicia (Xunta de Galicia); Citizens, irrigation associations	Aguas de Galicia (Xunta de Galicia); industrial plants around the area of treatment plant/system;	n/a	Aguas de Galicia (Xunta de Galicia)	Aguas de Galicia (Xunta de Galicia)

## 5.1.2 Stakeholder Mapping: Aarhus

Table 10: Stakeholder Mapping Aarhus (1/3):

Systematic Mapping Aarhus (1/3): Receiving Sealed Surfaces, Transport & Treatment				
Phase	Step  Process  Infrastructure Components	Receiving Sealed Surfaces  <i>Rain/Hail/Snow falls down on surfaces and the resulting water gets collected in some way or form</i>  <i>Public/private roofs, streets, parking lots, etc.</i>	Transport to WWT/Discharge  <i>The collected precipitation is channelled into a sewer system (either separated or combined; if separated, the next step can be skipped)</i>  <i>Sewer network from point(s) of collection to Wastewater Treatment Plant/to discharge</i>	Treatment  <i>The water is received by the local water treatment facility and treated for safe discharge or reuse (skip this part if your case has a separated sewer)</i>  <i>Wastewater Treatment Plant</i>
Planning	Polymaking: Who is in charge of making decisions for corresponding policies	Danish EPA, Local government, Utilities	Local government, Water utilities; Danish EPA	n/a
	Regulation: Who is in charge of enforcing the policy decisions	Local government, Water utilities	Local government, Water utilities	n/a
	Implementation: Who is in charge of implementing the policy decisions	Local government, Water utilities	Local government, Water utilities	n/a
	Budgets: Who is in charge/in control of relevant budgets?	National government, local government, Utilities	National government, local government, Utilities	n/a
Operation	Operation & Maintenance: Who is in charge of O&M?	Utilities	Utilities	n/a
	Monitoring & Evaluation: Who is in charge of M&E (e.g. binding environmental standards)?	Utilities; Danish EPA	Utilities	n/a
Other	Impacts: Who else is affected by the decisions made about UWR?	Citizens; Industries; NGO's	Citizens	n/a

Table 11: Stakeholder Mapping Aarhus (2/3):

Systematic Mapping Aarhus (2/3): Discharge			
Phase	Step Process Infrastructure Components	Discharge	
		The treated (collected) runoff water gets channelled into surface waters like rivers, lakes, the sea... Surface Water	Eventually, the treated runoff water is contributing to the replenishment of groundwater sources Groundwater
Planning	Polymaking: Who irresponsible for decision making for corresponding policies	Danish EPA, local government	Danish EPA, local government
	Regulation: Who is in charge of enforcing the policy decisions	Danish EPA, local government	Danish EPA, local government
	Implementation: Who is in charge of implementing the policy decisions	Local government, Water utilities	Local government, Water utilities
	Budgets: Who is in charge/in control of relevant budgets?	National government, local government, Utilities	National government, local government, Utilities
Operation	Operation & Maintenance: Who is in charge of O&M?	, Water utilities	, Water utilities
	Monitoring & Evaluation: Who is in charge of M&E (e.g. binding environmental standards)?	Danish EPA, local government	Danish EPA, local government
Other stakeholders	Impacts: Who else is affected by the decisions made about UWR?	Citizens	Citizens

Table 12: Stakeholder Mapping Aarhus (3/3):

Systematic Mapping Aarhus (3/3): Reuse						
Phase	Step Process	Reuse				
	Infrastructure Components	Agricultural Use <i>Irrigation Infrastructure</i>	Industrial Use <i>Industrial Production Infrastructure</i>	Domestic Use <i>Households</i>	Public "leisure" use <i>Lakes, Rivers, Swimming Pools, etc. that are of value for people's leisure</i>	Environmental Use <i>"Nature" i.e. Flora &amp; Fauna (sensitive to water quality)</i>
Planning	Policy-making: Who is in charge of making decisions for corresponding policies	N/a	N/a	Not allowed	N/a	N/a
	Regulation: Who is in charge of enforcing the policy decisions	N/a	N/a	Not allowed	N/a	N/a
	Implementation: Who is in charge of implementing the policy decisions	N/a	N/a	Not allowed	N/a	N/a
	Budgets: Who is in charge/in control of relevant budgets?	N/a	N/a	Not allowed	N/a	N/a
Operation	Operation & Maintenance: Who is in charge of O&M?	N/a	N/a	Not allowed	N/a	N/a
	Monitoring & Evaluation: Who is in charge of M&E (e.g. binding environmental standards)?	N/a	N/a	Not allowed	N/a	N/a
Other Stakeholders	Impacts: Who else is affected by the decisions made about UWR?	N/a	N/a	Not allowed	N/a	N/a

Based on the stakeholder mapping as well as the analysis of the target audience of the revised EU Directive, it becomes clear that the circle of key stakeholders for the WATERUN OER/KER is somewhat smaller than initially expected. This insight will be further validated in the section 5.2.

### 5.1.3 Stakeholder Mapping: International key actors

The establishment of the WATERUN International Stakeholder Board responds to the need of stimulating exchange with additional European and international experts, who can give us their feedback on the market-product-fit, innovation/added value and user-friendliness of new products/services. As opposed to the Local Stakeholder Boards, who are composed of users of the beta versions of the WATERUN OERs, the International Stakeholder Board act as a pool of informants for knowledge exchange.

Considering that WATERUN counts with a Jordanian component, in which project activities are taking place, it was decided to establish an International Stakeholder Board in Amman. The **Jordanian Stakeholder Board** is composed by the following members of the NIC Committee (National Implementation Committee for Effective Integrated Wastewater Management):

*Table 13: Members of the NICE committee, invited to the ISB:*

Entity	Name
Ministry of Water and Irrigation	SG/ or ASG
Water Authority of Jordan	SG/ or his delegation
Ministry of Environment	Ali Mashni/ Head of State of Environment and Environmental Indicators
Ministry of Agriculture	Talal Judeh/ Director of Water and Environment division
Ministry of Local Administration	Ranata Al-Zubi/ Head of Tender Department
Ministry of Planning and International Cooperation	Ebaa Al-Essa/Head of State of Water and Agriculture
Jordan Institute for Standardisation and Metrology	Bara Hiyari/ Director of Certification Department
Housing and Urban Development Corporation	Hani Nsour/ Director of supervision and infrastructure
Balqa Applied University	Nasir Al-Manaseer
German Jordanian University	Muna Hindeyyeh
University of Jordan	Maha Halalsheh
Royal Scientific Society	Rana Ardah
UFZ	Roland Muller/Environment and Biotechnology Centre

Moreover, other key stakeholders that have been mapped as potential members of the ISB are:

*Table 14: Other key stakeholders in Amman, invited to the ISB:*

Entity	Name
Greater Amman Municipality	Amman City Manager
Jordan Engineers Association	Vice-president: Eng. Fawzi Mesaad
Ministry of Local Administration	Assistant SG for services
Ministry of Public Works and Housing	Director of Roads Administration
Ministry of Interior	Director of directorate of public safety, traffic and environmental affairs
Jordan Standardisation and Metrological Organisation	Director of standardisation directorate
Ministry of Political and Parliamentary Affairs	Director of Legal Affairs directorate
Ministry of Health	Director of primary health administration

Ministry of Transport	Director of transportation safety and environment directorate
Royal Hashemite Court	Royal Initiatives and Development Projects
University of Jordan	Dr. Ghada Kassab
University of Jordan	Dr. Asharifa Hind Mohammad
University of Jordan	Dr. Mujahid Thunaibat
cewas	Aline Bussmann, Co-Director
cewas	Maisam Outum, country manager - Jordan

At an international level, two key networks of organisations are identified as potential partners for relevant exchange in the framework of International Stakeholder Board meetings. These are:

**International Water Association<sup>4</sup>.** This is a network of water professionals from more than 140 countries that brings together scientists, researchers, technology companies, water and wastewater utilities, and wider stakeholders involved in water management. The IWA membership communities contribute and develop the IWA Agendas, and organize the IWA World Water Congress & Exhibition, the IWA Water and Development Congress & Exhibition and the Specialist Groups Conferences worldwide.

**ICLEI<sup>5</sup>.** Local Governments for Sustainability is a global network working with more than 2500 local and regional governments committed to sustainable urban development. Active in 125+ countries, ICLEI influences sustainability policy and drive local action for low emission, nature-based, equitable, resilient and circular development. Its members and team of experts work together through peer exchange, partnerships and capacity building to create systemic change for urban sustainability.

Because of the mission and the core services provided by these two organisations, we decided to collaborate with them, leveraging its network and their events.

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<sup>4</sup> <https://iwa-network.org>

<sup>5</sup> <https://iclei.org>

## 5.2 Stakeholder Characterisation

The following sections show the results of the characterisation of the stakeholders based on the use of the OERS, conducted in the framework of brainstorming sessions with the case study core groups (in Spain on 02.02.2023 with CETAQUA, AIMEN and UDC, and in Denmark on 16.03.2023 with AU and AV).

### 5.2.1 LSB Characterisation Santiago de Compostela

Table 15: LSB Characterisation Santiago de Compostela:

WATERUN Solution	Potential end-user	Use case (How will the user use the solution?)	Who is the point of contact for the end-user
OER1: Portable monitoring system	VIAQUA	Reduce costs and increase resolution of monitoring pollutants in UWR	Leticia Rodríguez Hernández
	SERGAS	Improve understanding of pollutants in UWR	Paula Sánchez García
	Aguas de Galicia	Improve understanding of pollutants in UWR	Mónica Velo Cid
	Council of Santiago de Compostela	Improve decision-making for more sustainable UWR management	Miguel Fernández
OER2: CleanCityCover Application	Council of Santiago de Compostela	Improve (preventive) decision-making for more sustainable UWR management	Miguel Fernández
OER3: MUST-B	Aguas de Galicia	Develop guidelines on utilizing BGI for UWR management	Mónica Velo Cid
	Council of Santiago de Compostela	Take investment decisions related to (blue-green) UWR management infrastructure	Miguel Fernández
	VIAQUA	Formulate recommendations related to UWR management investment decisions	Leticia Rodríguez Hernández
OER4: Decision support system	Sanidad Ambiental; Servicio de Salud (SERGAS)	Monitor/restrict stormwater (Re-)use or discharge options	Paula Sánchez García
	Aguas de Galicia	Establish guidelines for the protection of water bodies	Mónica Velo Cid
	Council of Santiago de Compostela	Make UWR management decisions based on health and environmental risks	Miguel Fernández

## 5.2.2 LSB Characterisation Aarhus

Table 16: LSB Characterisation Aarhus:

WATERUN Solution	Potential end-user	Use case (How will the user use the solution?)	Who is the point of contact for the end-user
OER1: Portable monitoring system	Aarhus Vand	Reduce costs and increase resolution of monitoring pollutants in UWR	Anne Laustsen
	Municipality of Aarhus	Improve understanding of pollutants in UWR Improve decision-making for more sustainable UWR management	Anne Laustsen
OER2: CleanCityCover Application	Municipality of Aarhus	Improve (preventive) decision-making for more sustainable UWR management	Gitte Normand Andersen
	Aarhus Vand	Develop (preventive) decision-making approach to reduce costs of UWR management	Anne Laustsen
OER3: MUST-B	Aarhus Vand	Support for decision-making in UWR management	Anne Laustsen
	Municipality	Decision-making for more efficient UWR management	Gitte Normand Andersen
OER4: Decision support system	Consulting Companies	Offer decision support to municipalities and utilities	TBC
	Municipality	Risk based decision-making related to UWR reuse scenarios	Someone in the Municipality

The characterisation of the stakeholders in combination of the stakeholder mapping exercise resulted in a definitive list of key stakeholders to be prioritised during the Co-Creation Activities. These are the following:

*Table 17: List of Key Stakeholders in Santiago de Compostela and Aarhus:*

Santiago de Compostela	Aarhus
<b>Water Utility VIAQUA:</b> As user of OER1 and with interest in the learnings from the green infrastructure pilot (developed in WP4).	<b>Water Utilities Aarhus Vand and Vand Center Syd:</b> as user of all OERs hence potential of the KER as well
<b>Municipality Concello de Santiago de Compostela:</b> as user of the OER1 and the OER4.	<b>Municipalities of Aarhus, Syddjurs, Skanderborg:</b> as user of OER1, OER2, OER3 and/or OER4
<b>Water Authority Aguas de Galicia:</b> as user of OER2, OER3 and OER4 while planning their integrated water plans.	<b>Environmental Regulator EPA:</b> as user of OER1 and OER4
<b>Health Authority SERGAS:</b> as user of OER4 because of the health risk analysis that is provide by the tool.	
<b>State Government:</b> called Xunta de Galicia, in charge of supervising the municipal development and management plans will be interested on the KER (combination of all or a selection of the OERs).	
<b>Consulting Company TILIA:</b> as user of KER or individual OERs	<b>Consulting Companies NIRAS, DHI and TILIA:</b> as users of KER or individual OERs
<b>Research Partner AIMEN:</b> as key local facilitator	
<b>Research Partner UDC:</b> as key local facilitator	<b>Research Partner AU:</b> as key local facilitator

### 5.3 Stakeholder Participation Strategy and Identification of Design Milestones

Based on the stakeholder characterisation results, stakeholder participation strategies for each LSB were conceived. The following tables shows which stakeholders belong to each group and what are their participation strategies.

### 5.3.1 Stakeholder Participation Strategy in Santiago de Compostela

Table 18: Stakeholder Participation Strategy in Santiago de Compostela:

Group	Actors	Participation Strategy
Core group	VIAQUA; AIMEN; UDC;	Define board members & participate in all Co-Creation meetings
Regular Board Members	SERGAS; Aguas de Galicia; Concello de Santiago de Compostela	Participate in all local Co-Creation Meetings
Visitors and Invitees	Xunta de Galicia; TILIA	May be invited to meetings, depending on need/relevance
Secondary Stakeholders	Association of companies in Tambre and Sionlla; Citizens; Architects with sustainability focus	Are informed about the Co-Creation activities

### 5.3.2 Stakeholder Participation Strategy in Aarhus

Table 19: Stakeholder Participation Strategy in Aarhus:

Group	Actors	Participation Strategy
Core group	AV; AU	Define board members & participate in all Co-Creation meetings
Regular Board Members	Municipality of Aarhus;	Participate in all local Co-Creation Meetings
Visitors and Invitees	Municipality of Syddjurs; Municipality of Skanderborg; Consulting Companies NIRAS/DHI/TILIA; EPA; Vand Center Syd Danish EPA	May be invited to meetings, depending on need/relevance
Secondary Stakeholders	Citizens; NGOs	Are informed about the Co-Creation activities

### 5.3.3 Stakeholder Participation Strategy in Amman and in International Events

Table 20: Stakeholder Participation Strategy in Amman and International Events:

Group	Actors	Participation Strategy
Core group	University of Jordan AIMEN	Define board members & participate in all Co-Creation meetings
Regular Board Members	NICE members	Participate in all local Co-Creation Meetings in Amman
Visitors and Invitees	IWA members ICLEI members	May be invited to meetings, depending on need/relevance

Secondary Stakeholders	Citizens; NGOs	Are informed about the Co-Creation activities
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### 5.3.4 Identification of Design Milestones

In parallel WATERUN project partners, in May 2023, were tasked to map the key development milestones of their WATERUN solutions against the WATERUN project time plan to better determine the adequate timing for corresponding Co-Creation Activities (see picture below). The consolidated version can be found in the next section.

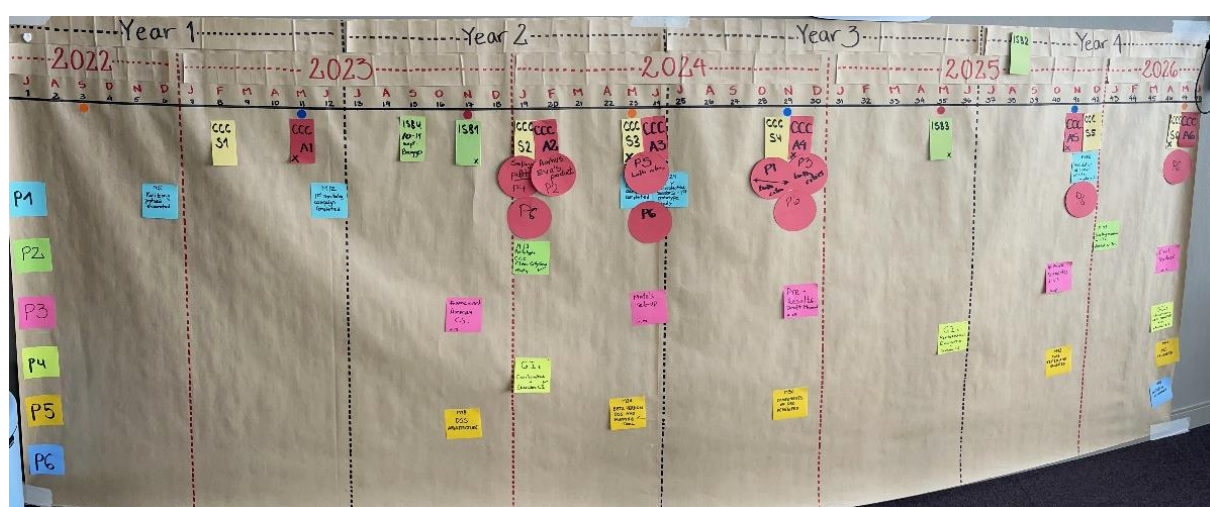


Figure 9 First Draft of the Co-Creation Action Plan

As it can be seen in Figure 12, partners mapped the following key milestones:

**P1** OER 1 (Portable monitoring system): in May 2024, the Dublin City University (DCU) will have the first prototype ready.

**P2** OER 2 (CleanCityCover Application): in November 2023, the Technical University of Berlin (TUB) will have the prototype ready.

**P3** OER 3 (MUST-B): the Center Helmholtz for Environmental Research (UFZ) will have the models ready in May 2024, and the first results in November 2024.

**P4** – green infrastructure: in January 2024, the new infrastructure in Santiago de Compostela will be ready.

**P5** OER 4 (decision support system): in December 2023, the Polytechnical University of Marche (UNIVPM) will have the architecture ready, and in May 2024, the Beta Version of the DSS and the mapping tool will be ready.

**P6** KER (Guidance of WATERUN UWR management methodology): at the end of the project, the guidelines should be ready.

This mapping guides the distribution of the co-creation events by OERs in time.





## LSB1 Meeting in Santiago de Compostela: Introduction to the project

Expected implementation month: February 2023

Key partners: AIMEN, Project Coordinator and local hosts, VIAQUA

*Table 21: Concept Note of the LSB1 Meeting in Santiago de Compostela:*

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Establish a conceptual framework on runoff water management and diffuse pollution.</li> <li>▪ Obtain initial feedback on the WATERUN products.</li> <li>▪ Learn about the pilot projects in the Industrial Park of Tambre and A Sionlla.</li> <li>▪ Understand the roadmap of the committee.</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Judith Ponceth, Mónica Velo Cid, Aguas de Galicia</li> <li>- Manuel Álvarez Cortiñas, Paula Sánchez García, Sergas</li> <li>- Pablo Martín, Rocío Montañés, Concello de Santiago</li> <li>- Ana Tejeiro, Leticia Rodríguez Hernández, David Permui, Viaqua</li> <li>- Sergio Santorio, Cetaqua</li> <li>- Santiago Cuervo, Raquel Pérez, Luz Herrero, Aimen</li> <li>- Joaquín Suárez, José Anta, Angélica Goya, UDC</li> <li>- Francisco Carballo, E3 Arquitectos</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What challenges and risks do the stakeholders perceive and what doubts do you have when learning about the WATERUN Solutions? (What are the pains?)</li> <li>• Which additional features of the WATERUN Solutions would increase the added value in the eyes the stakeholders? (What are the gains?)</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>○ Introduction to WATERUN</li> <li>○ Introduction to UWR Management</li> <li>○ Brief introduction to the WATERUN Solutions</li> <li>○ WATERUN Solution Booths and Feedbacks based on the “discussion forums” tool</li> <li>○ Conclusions &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Documented Feedbacks (Pains and Gains) for each of the WATERUN OERs</li> <li>- KO2: Internal Report on the results of the event for the WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

As this event took place in February 2023, results are presented in section 7.1.

## LSB2 Meeting in Santiago de Compostela: Focus on OER4 (Decision Support System)

Expected implementation month: February 2024

Key partner: Polytechnical University of Marche -UNIVPM, leader of WP5 and developer of the system

Table 22: LSB2 Meeting in Santiago de Compostela:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Introduce participants to OER4 in-depth</li> <li>▪ Obtain feedback on the tool's functionality (Focus on Health Risks).</li> <li>▪ Get feedback on the value, usability, and cost-benefit ratio of the tool.</li> <li>▪ Update the audience on the progress of the pilot project in Tambre and A Sionlla.</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Judith Ponceth, Mónica Velo Cid, Aguas de Galicia</li> <li>- Manuel Álvarez Cortiñas, Paula Sánchez García, Sergas</li> <li>- Pablo Martín, Rocío Montañés, Concello de Santiago</li> <li>- Ana Tejeiro, Leticia Rodríguez Hernández, David Permui, Viaqua</li> <li>- Sergio Santorio, Cetaqua</li> <li>- Santiago Cuervo, Raquel Pérez, Luz Herrero, Aimen</li> <li>- Angélica Goya, UDC</li> <li>- Francisco Carballo, E3 Arquitectos</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What are thoughts and concerns of stakeholders regarding the various requirements, functionalities, and capabilities of the tools?</li> <li>• How relevant is the proposed solution to the challenges faced by the participants? What would enhance the value of the solution?</li> <li>• How easy is it for the participants to integrate the solution into their work? What would make it easier to use?</li> <li>• How do stakeholders evaluate the cost-benefit relationship?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>○ Welcome words</li> <li>○ Presentation of the UNIVPM DSS tool (Francesco Fatone)</li> <li>○ Presentation of the Cupra Marittima Case Study (Lucia De Simoni)</li> <li>○ Collaborative analysis of the "user journey" of the UNIVPM DSS tool</li> <li>○ Final discussion related to the value, usability, and cost-effectiveness ratio of the solution from the participants' perspective</li> <li>○ Conclusion &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Documented feedback from local stakeholders on the functionality of OER4 together with inputs related to the added value, usability and cost-effectiveness ratio of the solution</li> <li>- KO2: Internal report summarizing the key inputs from the stakeholders for UNIVPM</li> <li>- KO3: External report summarizing the main results and conclusions for the local stakeholders</li> </ul>

As this event took place in February 2024, results are presented in section 7.3.

### LSB3 Meeting in Santiago de Compostela: Focus on OER1 (Portable monitoring system)

Expected implementation month: November 2024

Key partner: Dublin City University (DCU), leader of WP2 and developer of the monitoring system

Table 23: LSB3 Meeting in Santiago de Compostela:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Gather input from the local stakeholders regarding the value proposition of the DCU solution in general and regarding the user friendliness, perceived reliability, added value, and cost reduction potential in particular.</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Aguas de Galicia</li> <li>- VIAQUA/CETAQUA</li> <li>- SERGAS</li> <li>- Concello de Santiago</li> <li>- UDC</li> <li>- AIMEN</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• Design &amp; User friendliness: Are the proposed tools required for the analysis (e.g. collection device, centrifugal disk/test interface, app, box, etc.) user friendly and adequate considering the skill level and working conditions of the field staff?</li> <li>• Reliability 1: What are the end-users main concerns in terms of producing false negatives OR false positives caused by contaminated samples?</li> <li>• Reliability 2: What are main concerns related to the reliability of the results in terms of sample size and generalizability of results?</li> <li>• Added value &amp; Use case: To what extent do the end-users validate the added value of the approach and how could the added value be increased (= do they agree that it is useful in their context)?</li> <li>• Cost reduction potential: To what extent to the end-users validate the potential for cost reduction in the area of UWR monitoring and what could further increase that potential (= do they agree that this could help make UWR monitoring quicker and less expensive)?</li> <li>• Microplastics Sample: are end-users concerned about the size and/or type of microplastics?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>- Welcome &amp; (Re)introduction to WATERUN</li> <li>- Introduction to DCU WATERUN Solution: What is the purpose? How does it work? What can be achieved with it?</li> <li>- (Live) Demonstration and Prototype showcasing</li> <li>- Interactive workshop: feedback on guiding questions</li> <li>- Concluding remarks &amp; next steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: 4 – 6 clusters of feedback relating to the guiding questions listed above</li> <li>- KO2: Internal report on the key results of the workshop (for DCU)</li> <li>- KO3: Report on the key results of the workshop (for the workshop participants)</li> </ul>

## LSB4 Meeting in Santiago de Compostela: Focus on OER3 (MUST-B)

Expected implementation month: November 2024

Key partners: Centre Helmholtz for Environmental Research (UFZ)

Table 24: LSB4 Meeting in Santiago de Compostela:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>To gather inputs from local stakeholders in Santiago de Compostela (and other municipalities) related to the design of the MUST-B scenario calculation results visualisation SCRv (e.g. heat maps) in order to increase the added value, relevance and usability of the MUST-B approach in a setting such as Santiago de Compostela as a whole.</li> </ul>
Target audience	<p>Actors/staff within the local authorities and utilities tasked with taking investment decisions related to urban stormwater management.</p> <ul style="list-style-type: none"> <li>- Municipality Concello de Santiago de Compostela</li> <li>- Water Utility VIAQUA</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What information do you need from the MUST-B results visualisation to take good decisions?</li> <li>• To what degree is the format of the visualisation of the results adequate and how can it be improved?</li> <li>• Assuming that you have the necessary information to take the corresponding decisions, what are your constraints/conflicts in the context of the application of decentralised NBS?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>- Welcome &amp; (Re)introduction to WATERUN</li> <li>- Introduction to MUST-B: What is the purpose? How does it work? What can be achieved with it?</li> <li>- Presentation of the application of MUST-B in Santiago de Compostela</li> <li>- Interactive workshop: How to improve MUST-B SCRv (see guiding questions)</li> <li>- Concluding remarks</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1 – Three separate clusters of participant feedback each corresponding to one of the guiding questions (facilitation cards on canvas)</li> <li>- KO2 – Internal report for UFZ summarizing &amp; synthesizing feedbacks from the workshop participants to each of the three corresponding guiding questions.</li> <li>- KO3 – External report for the workshop participants summarizing &amp; synthesizing feedbacks from the workshop</li> </ul>

## **LSB5 Meeting in Santiago de Compostela: Focus on KER (Guidance for methodological implementation of WATERUN UWR management)**

Expected implementation month: September 2025

Key partners: Polytechnical University of Marche -UNIVPM, leader of WP5 and AIMEN, Project Coordinator

*Table 25: LSB5 Meeting in Santiago de Compostela:*

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ To validate early version of the WATERUN global guidance (KER)</li> <li>▪ Obtain feedbacks from stakeholders related to the optimisation of product-market-fit, added value and user-friendliness as well as the decrease of risks related to feasibility, desirability and viability</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Aguas de Galicia</li> <li>- VIAQUA/CETAQUA</li> <li>- SERGAS</li> <li>- Concello de Santiago</li> <li>- Tilia</li> <li>- UDC</li> <li>- AIMEN</li> </ul> <p>Possibly, we will invite other municipalities in the region.</p>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What characteristics, benefits and experiences should the WATERUN global guidance provide to optimise product-market-fit, added value and user-friendliness?</li> <li>• How can its feasibility, desirability and viability be increased?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>○ Welcome &amp; Introduction</li> <li>○ Introduction to the preliminary version of the WATERUN global guidance</li> <li>○ Interactive “Brochure” Workshop</li> <li>○ Short presentation of the results</li> <li>○ Conclusions &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: 2-3 versions of an “ideal” WATERUN global guidance in the format of draft “Brochures” co-created with the stakeholders</li> <li>- KO2: Internal Report on the results of the event for the WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

## LSB6 Meeting in Santiago de Compostela: Focus on Exploitation Strategies of all OER

Expected implementation month: May 2025

Key partners: AIMEN (Project Coordinator), DCU (developer of OER1), TUB (developer of OER2), UFZ (developer of OER3), UNIVPM (developer of OER4), and Tillia (exploitation partner)

Table 26: LSB6 Meeting in Santiago de Compostela:

Key Aspect	Description
Objective of the co-creation workshop?	Validate the relevance, applicability and value of the WATERUN KER (combination of several or all OER)
Target audience	<ul style="list-style-type: none"> <li>- Utility VIAQUA / CETAQUA</li> <li>- Consello de Santiago de Compostela</li> <li>- Aguas de Galicia</li> <li>- Consulting Companies TILIA</li> <li>- All WATERUN OER leaders DCU, TUB, UFZ, UNIVPM</li> <li>- Other potential exploitation partners</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• To what extent can some/all WATERUN OER be combined to increase the added value of the WATERUN OER?</li> <li>• What are the most promising combinations of OERs?</li> <li>• What are the most promising market entry points for different versions of the WATERUN KER?</li> <li>• What is needed to push WATERUN KER closer to market-readiness?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>○ Welcome and Introduction</li> <li>○ Presentation of WATERUN OERs</li> <li>○ “Mash-up” Innovation Workshop</li> <li>○ Peer-Presentation of results</li> <li>○ Conclusions &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: 3-4 draft versions of a combined offer consisting of multiple WATERUN OER</li> <li>- KO2: Internal Report on the results of the event for the WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

### 5.4.3 Local Stakeholder Boards co-creation sessions in Aarhus

As expressed in the previous sections, in Aarhus, a total of 6 co-creation sessions will take place. The following tables present the concept note for each co-creation session that will take place in Aarhus, Denmark. This includes key information on objective of the meeting, target audience, guiding questions to be answered and a draft agenda.

#### LSB1 Meeting in Aarhus: Introduction to the Project

Expected implementation month: February 2023

Key partners: AIMEN, Project Coordinator and local hosts, AU and AV

Table 27: LSB1 Meeting in Aarhus:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Present WATERUN and the co-creation process</li> <li>▪ Obtain a first round of feedback of our WATERUN products</li> <li>▪ Establish the next steps</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Solvei Mundbjerg Jensen, Syddjurs kommune</li> <li>- Francisca Braga, Skanderborg Kommune</li> <li>- Morten Rebsdorf, Aarhus Vand</li> <li>- Malte Kristian Skovby Ahm, Aarhus Vand</li> <li>- Gitte Normand Andersen, Municipality of Aarhus</li> <li>- Nikolaj Kruse Christensen, Municipality of Aarhus</li> <li>- Uffe Linneberg Gangelhof, Vand Center Syd (Odense)</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What challenges and risks do the stakeholders perceive and what doubts do you have when learning about the WATERUN Solutions? (What are the pains?)</li> <li>• Which additional features of the WATERUN Solutions would increase the added value in the eyes the stakeholders? (What are the gains?)</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>○ Introduction to WATERUN</li> <li>○ Brief introduction to the WATERUN Solutions</li> <li>○ WATERUN Solution Booths and Feedbacks based on the “discussion forums” tool</li> <li>○ Conclusions &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Documented Feedbacks (Pains and Gains) for each of the WATERUN OERs</li> <li>- KO2: Internal Report on the results of the event for the WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

As this event took place in May 2023, results are presented in section 7.2.

## LSB2 Meeting in Aarhus: Focus on OER2 (CleanCityCover)

Expected implementation month: May 2024

Key partner: TUB as developer of the CleanCityCover application

Table 28: LSB2 Meeting in Aarhus:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>To validate the exploitation scenario co-developed with TUB during the preparation workshop at TUB in late 2023. Further, the workshop should allow testing interest of potential exploitation partners in engaging in the WATERUN exploitation activities.</li> </ul>
Target audience	<p>The primary target audience consists of actors in the Danish water sector that offer consulting services to local authorities and utilities related to urban planning in general and UWR management in particular. The audience will include participants like:</p> <ul style="list-style-type: none"> <li>- TILIA, Consulting Company</li> <li>- NIRAS, Consulting Company</li> <li>- DHI, Consulting Company</li> </ul> <p>In addition, personnel within local authorities and utilities that are tasked with decision-making based on UWR monitoring/management as well as personnel tasked with designing/leading UWR monitoring campaigns/systems are invited to participate. This audience will include participants like:</p> <ul style="list-style-type: none"> <li>- Gitte Normand Andersen, Municipality of Aarhus</li> <li>- Nikolaj Kruse Christensen, Municipality of Aarhus</li> <li>- Solvei Mundbjerg Jensen, Syddjurs kommune</li> <li>- Morten Rebsdorf, Aarhus Vand</li> <li>- Malte Kristian Skovby Ahm, Aarhus Vand</li> <li>- Francisca Braga, Skanderborg Kommune</li> <li>- Maria Lund, Danish EPA</li> <li>- Uffe Linneberg Gangelhof, Vand Center Syd (Odense)</li> <li>- Anne Laustsen, AV</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• Feasibility: To what extent do the stakeholders estimate that their organisations have the technical capacities to adopt this product to convert it into a service? How could the solution become easier to adopt and replicate?</li> <li>• Desirability: To what extent do the stakeholders see a willingness to pay, potential market and corresponding business opportunity in Denmark and beyond? How could the willingness to pay be increased and the potential market opportunity seized?</li> <li>• Viability: To what extent do stakeholders estimate that the CleanCityCover will create enough value for end-users to justify a</li> </ul>

	<p>price that allows them to cover the costs related to the application of the CCC App?</p> <ul style="list-style-type: none"> <li>• Exploitation Scenario: Would stakeholders be interested to continue exploring exploitation scenarios (e.g., by attending the upcoming business development workshop).</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>○ Welcome &amp; short (Re)introduction to WATERUN</li> <li>○ Introduction to CleanCityCover: What is the purpose? How does it work? What can be achieved with it?</li> <li>○ Short (Live) Demonstration and prototype showcasing</li> <li>○ Interactive workshop: feedbacks on guiding questions</li> <li>○ Concluding remarks &amp; next steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Feedback on Feasibility, Desirability, Viability of the CCC App</li> <li>- KO2: Initial feedback on the potential exploitation scenarios.</li> <li>- KO3: Expression of Interest from potential exploitation partners to participate in the Business Model Development Workshop</li> <li>- KO4: Internal report on the key results of the workshop (for TUB)</li> <li>- Report on the key results of the workshop (for the workshop participants)</li> </ul>

### LSB3 Meeting in Aarhus: Focus on OER1 (Portable monitoring system)

Expected implementation month: May 2024

Key partners: DCU as developer of the monitoring system

Table 29: LSB3 Meeting in Aarhus:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>Gather input from the local stakeholders regarding the value proposition of the DCU solution in general and regarding the user friendliness, perceived reliability, added value, and cost reduction potential in particular.</li> </ul>
Target audience	<p>Personnel within local authorities and utilities that are tasked with decision-making based on UWR monitoring/management as well as personnel tasked with designing/leading UWR monitoring campaigns/systems. Audience will include participants like:</p> <ul style="list-style-type: none"> <li>- Gitte Normand Andersen, Municipality of Aarhus</li> <li>- Nikolaj Kruse Christensen, Municipality of Aarhus</li> <li>- Solvei Mundbjerg Jensen, Syddjurs kommune</li> <li>- Solvei Mundbjerg Jensen, Syddjurs commune</li> <li>- Morten Rebsdorf, Aarhus Vand</li> <li>- Malte Kristian Skovby Ahm, Aarhus Vand</li> <li>- Maria Lund, Danish EPA</li> <li>- Francisca Braga, Skanderborg Kommune</li> <li>- Uffe Linneberg Gangelhof, Vand Center Syd (Odense)</li> <li>- (Decision making level in case of Must-B, more technical level for TUB)</li> <li>- Anne Laustsen, AV (Decision making level in case of Must-B, more technical level for TUB)</li> <li>- TILIA, Consulting Company</li> <li>- NIRAS, Consulting Company</li> <li>- DHI, Consulting Company</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• Design &amp; User friendliness: Are the proposed tools required for the analysis (e.g. collection device, centrifugal disk/test interface, app, box, etc.) user friendly and adequate considering the skill level and working conditions of the field staff?</li> <li>• Reliability 1: What are the end-users main concerns in terms of producing false negatives OR false positives caused by contaminated samples?</li> <li>• Reliability 2: What are main concerns related to the reliability of the results in terms of sample size and generalizability of results?</li> <li>• Added value &amp; Use case: To what extent do the end-users validate the added value of the approach and how could the added value be increased (= do they agree that it is useful in their context)?</li> </ul>

	<ul style="list-style-type: none"> <li>• Cost reduction potential: To what extent to the end-users validate the potential for cost reduction in the area of UWR monitoring and what could further increase that potential (= do they agree that this could help make UWR monitoring quicker and less expensive)?</li> <li>• Microplastics Sample: are end-users concerned about the size and/or type of microplastics?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>- Welcome &amp; (Re)introduction to WATERUN</li> <li>- Introduction to DCU WATERUN Solution: What is the purpose? How does it work? What can be achieved with it?</li> <li>- (Live) Demonstration and Prototype showcasing</li> <li>- Interactive workshop: feedback on guiding questions</li> <li>- Concluding remarks &amp; next steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: 4 – 6 clusters of feedback relating to the guiding questions listed above</li> <li>- KO2: Internal report on the key results of the workshop (for DCU)</li> <li>- KO3: Report on the key results of the workshop (for the workshop participants)</li> </ul>

## LSB4 Meeting in Aarhus: Focus on OER3 (MUST-B)

Expected implementation month: May 2025

Key partners: UFZ as developer of MUST-B.

Table 30: LSB4 Meeting in Aarhus:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>Gather input from stakeholders in a separate sewer setting in general and in cities like Aarhus in particular, to understand how the applicability of the tool can be increased? Including e.g. Inputs related to scenarios (which are relevant?). End goal: inputs for the next iteration of the MUST-B development.</li> </ul>
Target audience	<p>Personnel within the local authorities and utilities tasked with taking investment decisions related to the upgrade/expansion of their rainwater sewer systems. Including:</p> <ul style="list-style-type: none"> <li>- Gitte Normand Andersen, Municipality of Aarhus</li> <li>- Nikolaj Kruse Christensen, Municipality of Aarhus</li> <li>- Solvei Mundbjerg Jensen, Syddjurs kommune</li> <li>- Uffe Linneberg Gangelhof, Vand Center Syd (Odense)</li> <li>- Maria Lund, Danish EPA</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>What are scenarios that are relevant and that you would like to be able to compare in Aarhus and other involved cities? -&gt; E.g. Scenarios to compare: performance of infrastructure types to increase capacity of our rainwater sewer system; change in demographic aspects; Climate Change impacts; rainwater reuse.</li> <li>If scenario A or B is included, what should the MUST-B approach be able to provide in terms of a basis for decision-making? What does the ideal result look like?</li> <li>What factors influence your tolerance related to uncertainty levels of the outputs and what would be an ideal way to communicate/show these uncertainties?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>○ Welcome &amp; (Re)introduction to WATERUN</li> <li>○ Introduction to MUST-B: What is the purpose? How does it work? What can be achieved with it?</li> <li>○ Presentation of the case study in Santiago</li> <li>○ Interactive workshop: Applicability in Aarhus (see three guiding questions above)</li> <li>○ Concluding remarks</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1 – Three separate clusters of participant feedback each corresponding to one of the guiding questions (facilitation cards on canvas)</li> <li>- KO2 – Internal report for UFZ summarizing &amp; synthesizing feedbacks from the workshop participants to each of the three corresponding guiding questions.</li> <li>- KO3 – External report for the workshop participants summarizing &amp; synthesizing feedbacks from the workshop</li> </ul>

### LSB5 Meeting in Aarhus: focus on OER4 (DSS based on Health Risk Assessment)

Expected implementation month: May 2025

Key partners: Polytechnical University of Marche -UNIVPM, as the developer of the system

Table 31: LSB5 Meeting in Aarhus:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Introduce participants to OER4 in-depth</li> <li>▪ Obtain feedback on the tool's functionality (Focus on Environmental Risks).</li> <li>▪ Get feedback on the value, usability, and cost-benefit ratio of the solution.</li> <li>▪ Update the audience on the progress of the pilot project in Tambre and A Sionlla.</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Syddjurs Kommune</li> <li>- Skanderborg Kommune</li> <li>- Aarhus Vand</li> <li>- Municipality of Aarhus</li> <li>- Vand Center Syd (Odense)</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What are thoughts and concerns of stakeholders regarding the various requirements, functionalities, and capabilities of the solution?</li> <li>• How relevant is the proposed solution to the challenges faced by the participants? What would enhance the value of the solution?</li> <li>• How easy is it for the participants to integrate the solution into their work? What would make it easier to use?</li> <li>• How do stakeholders evaluate the cost-benefit relationship?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>○ Welcome words</li> <li>○ Presentation of the UNIVPM DSS tool (Francesco Fatone)</li> <li>○ Presentation of the Cupra Marittima Case Study (Lucia de Simoni)</li> <li>○ Collaborative analysis of the "user journey" of the UNIVPM DSS tool</li> <li>○ Final discussion related to the value, usability, and cost-effectiveness ratio of the solution from the participants' perspective</li> <li>○ Conclusion &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Documented feedback from local stakeholders on the functionality of OER4 together with inputs related to the added value, usability and cost-effectiveness ratio of the solution</li> <li>- KO2: Internal report summarizing the key inputs from the stakeholders for UNIVPM</li> <li>- KO3: External report summarizing the main results and conclusions for the local stakeholders</li> </ul>

## LSB6 Meeting in Aarhus: Focus on KER (Guidance for methodological implementation of WATERUN UWR management)

Expected implementation month: October 2025

Key partners: Polytechnical University of Marche -UNIVPM, leader of WP5 and AIMEN, Project Coordinator

Table 32: LSB6 Meeting in Aarhus:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ To validate early version of the WATERUN global guidance (KER)</li> <li>▪ Obtain feedbacks from stakeholders related to the optimisation of product-market-fit, added value and user-friendliness as well as the decrease of risks related to feasibility, desirability and viability</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Utilities Aarhus Vand, Vand Center Syd</li> <li>- EPA</li> <li>- Municipalities Aarhus, Syddjurs, Skanderborg</li> <li>- AU</li> <li>- Consulting Companies TILIA, NIRAS, DHI</li> <li>- WATERUN Innovators DCU, TUB, UFZ, UNIVPM</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What characteristics, benefits and experiences should the WATERUN global guidance provide to optimise product-market-fit, added value and user-friendliness?</li> <li>• How can its feasibility, desirability and viability be increased?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>○ Welcome &amp; Introduction</li> <li>○ Introduction to the preliminary version of the WATERUN global guidance</li> <li>○ Interactive “Brochure” Workshop</li> <li>○ Short presentation of the results</li> <li>○ Conclusions &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: 2-3 versions of an “ideal” WATERUN global guidance in the format of draft “Brochures” co-created with the stakeholders</li> <li>- KO2: Internal Report on the results of the event for the WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

#### 5.4.4 International Stakeholder Board Meetings

As mentioned in the previous sections, the International Stakeholder Board will have modalities. On one hand, there will be a Jordanian Stakeholder Board, based in Amman, composed by the members of the NIC Committee (National Implementation Committee for Effective Integrated Wastewater Management) and other key stakeholders of the water sector. Furthermore, an international chapter will be established, which will be crystalised in the framework of an IWA meeting and a ICLEI Europe meeting.

In total, there will be 4 ISB meetings, which are described in the following lines:

##### **ISB1: Focus on regulating water runoff diffuse pollution in Jordan and Europe**

Expected implementation month: June 2024

Key partners: University of Jordan as the host and WAREG, the European Water Regulators of Europe.

*Table 33: ISB1 in Amman:*

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ To exchange about the latest trends on regulatory measures to control diffuse pollution with a special focus on the issue of UWR quality.</li> <li>▪ To introduce the WATERUN initiative to the Jordanian Authorities.</li> <li>▪ To exchange about initiatives to manage diffuse pollution in Europe and Jordan</li> <li>▪ To obtain a first round of feedback from Jordanian stakeholders.</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Local decision makers including: Greater Amman Municipality, Ministry of Local Administration, Ministry of Public Works and Housing, Ministry of Interior, Ministry of Political and Parliamentary Affairs</li> <li>- Regulators: Jordan Standardisation and Meteorological Organisation</li> <li>- Research institutions and Civil Society Organisations including: University of Jordan and Cewas</li> <li>- Members of the NICE Committee (National Implementation Committee for Effective Integrated Wastewater Management)</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• Environmental trends: What role does diffuse pollution from urban water runoff play in the integral management and protection of hydrological resources?</li> <li>• Regulatory trends: What regulatory trends emerge from the latest scientific findings in the EU (and elsewhere)?</li> <li>• Innovation trends: How can initiatives such as WATERUN contribute to local initiatives aiming at the prevention and mitigation of diffuse pollution from urban runoff in the EU and abroad?</li> </ul>

Draft agenda	<ul style="list-style-type: none"><li>- Welcome words</li><li>- Introduction to diffuse pollution from urban water runoff</li><li>- Initiatives to manage urban water runoff in Jordan</li><li>- The new proposal of the EU Wastewater Directive and its focus on urban water runoff and overflow</li><li>- How WATERUN contributes to prevent and mitigate diffuse pollution from urban runoff</li><li>- Presentation of the WATERUN Initiative in Jordan</li><li>- Site Visit in Amman</li></ul>
Key Outputs	<ul style="list-style-type: none"><li>- KO1: Hand-out documenting all inputs (PowerPoint slides)</li><li>- KO2: Report documenting and summarizing feedback/comments from participants</li></ul>

## ISB2: Focus on WP4, OER3 & OER4/Co-Creation Methodology

Expected implementation month: November 2024, in the framework of the 18th International Conference of Wetland Systems for Water Pollution Control

Key partners: AIMEN, UNIVPM, UFZ, AU and SEECON, who will participate in the conference.

*Table 34: ISB 2 Meeting at the IWA meeting, Martinique:*

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Gather expert feedback on the development of WATERUN relevant OER/KER</li> <li>▪ To provide a hands-on, learning-by-doing example of user centric design thinking approaches to collaborate with stakeholders while ideating and developing project results.</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Leading sector experts participating in the 18th International Conference of Wetland Systems for Water Pollution Control</li> <li>- Research institutions that want to enrich their organisational profile when it comes to the development of impact-oriented innovation, and</li> <li>- Industry pioneers interested in co-creating new products and services with customers.</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• Which elements of WATERUN OERs can be improved in light of the overarching goal of water-sensitive urban design?</li> <li>• What challenges do organisations face in navigating the shift towards exploiting research and innovation outcomes under Horizon Europe?</li> <li>• How can co-creation methodologies, as demonstrated in projects like WATERUN, be applied and improved to create impactful pathways within the Horizon Europe framework?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>- Welcome &amp; Agenda</li> <li>- Context &amp; Introduction to WATERUN</li> <li>- Co-Creation as a method to create impactful pathways</li> <li>- Presentation of WATERUN solutions (WP4, OER3 &amp; OER4 TBC)</li> <li>- Live application of a co-creation tool: “Sales Force Feedback” and/or “Expert Stakeholder Interviews” (TBC)</li> <li>- Conclusions &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Documented feedback from sector experts on the feasibility, desirability and viability of one early version of the WATERUN KER</li> <li>- KO2: Internal Report on the results of the event for the corresponding WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

### ISB3: Focus on WATERUN Toolbox

Expected implementation month: February 2025

Key partners: SEECON, as the developer of the WATERUN Toolbox

Table 35: ISB3 Meeting in Europe in collaboration with ICLEI:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>Identify key challenges and opportunities that emerge for local governments in light of the new EU directive</li> <li>Gather inputs from local governments in the EU to align the design and positioning of the WATERUN KER/its presentation on the WATERUN Toolbox with their needs and wants</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>Members of ICLEI - Local Governments for Sustainability, based in Europe.</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>What are key challenges and opportunities that emerge for local governments in light of the new EU directive?</li> <li>What are the needs and wants of local governments in the EU that emerge from these challenges and opportunities?</li> <li>How can the design and the positioning of the WATERUN Toolbox best be aligned with those needs and wants?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>Welcome &amp; Introduction</li> <li>Introduction to the new EU directive on urban wastewater management</li> <li>Value Proposition Canvas workshop (1/2): Emerging key challenges and opportunities for local governments</li> <li>Conclusions and Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>KO1: Documented feedback from key sector stakeholders' experts related to the design on WATERUN toolbox</li> <li>KO2: Internal Report on the results of the event for the corresponding WATERUN project partners</li> <li>KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

#### ISB4: Focus on all OERs/KER

Expected implementation month: November 2025

Key partners: AIMEN (Project Coordinator), DCU (developer of OER1), TUB (developer of OER2), UFZ (developer of OER3), UNIVPM (developer of OER4), and Tillia (exploitation partner)

Table 36: ISB4 Meeting in Amman:

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Identifying use cases of WATERUN OERs/KER in Jordan (and other non-EU countries)</li> <li>▪ Identifying gains and pains emerging from a non-EU perspective considering the design of the WATERUN OER</li> <li>▪ Opportunities for (future) knowledge transfer from EU-based Project Partners to Jordan-based Project Partners</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Local decision makers including: Greater Amman Municipality, Ministry of Local Administration, Ministry of Public Works and Housing, Ministry of Interior, Ministry of Political and Parliamentary Affairs</li> <li>- Regulators: Jordan Standardisation and Meteorological Organisation</li> <li>- Research institutions and Civil Society Organisations including: University of Jordan and Cewas</li> <li>- Members of the NICE Committee (National Implementation Committee for Effective Integrated Wastewater Management)</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What are use cases for the WATERUN KER in regions beyond the EU?</li> <li>• What are opportunities (gains) and challenges (pains) emerging from the WATERUN OERs from a non-EU perspective?</li> <li>• How can key insights from WATERUN be transferred and considered in non-EU countries such as Jordan?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>- Welcome &amp; Introduction</li> <li>- (Re-)introduction to the WATERUN project</li> <li>- 4 focus group discussions including short presentation of the OERs (OER1-OER4)</li> <li>- Plenary presentation of the focus group discussion results</li> <li>- Plenary discussion: Opportunities for (future) knowledge transfer</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Documentation of inputs gathered from the focus group discussions</li> <li>- KO2: Documentation of inputs gathered from the plenary discussions</li> <li>- KO2: Internal Report on the results of the event for the corresponding WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

### 5.4.5 Virtual Intercity Meetings

As explained in section 3, Virtual Inter-City Meetings (VIM) between the two EU-based case study cities are organised to seek complementarities between both implementations and enrich the co-creation process.

In total, 4 virtual intercity meetings are planned. The following lines describe each of them:

#### VIM1: Focus on OER2 (CleanCityCover)

Expected implementation month: September 2024

Key partners: TUB as developer of CleanCityCover

*Table 37: Intercity Virtual Meeting 1:*

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Identify and document key differences between WSUD approaches and priorities in Aarhus and Santiago de Compostela.</li> <li>▪ Identify and document are key differences and similarities in the way Aarhus and Santiago de Compostela approaches diffuse pollution control.</li> <li>▪ Identify and document consequences for the product-market-fit of the CleanCityCover App and aspects to be prioritised to increase TRL</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Core Group/Board Members of the LSB in Santiago de Compostela and Aarhus</li> <li>- Relevant Invitees/Visitors</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What are key differences and similarities between WSUD approaches and priorities in Aarhus and Santiago de Compostela?</li> <li>• What are key differences and similarities in the way Aarhus and Santiago de Compostela approaches diffuse pollution control?</li> <li>• What consequences can be derived for the product-market-fit of the CleanCityCover App and what aspects need to be prioritised to increase TRL?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>- Welcome &amp; Introduction</li> <li>- Introduction of CleanCityCover App in the Context of WSUD</li> <li>- Interactive Workshop: Key differences and similarities Aarhus vs Santiago de Compostela</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Documentation of feedback gathered from participants related to the guiding questions</li> <li>- KO2: Internal Report on the results of the event for the corresponding WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

## VIM2: Focus on WATERUN Toolbox

Expected implementation month: March 2025

Key partners: SEECON, as the developer of the WATERUN Toolbox

*Table 38: Intercity Virtual Meeting 2:*

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>Identify relevant features, benefits of the end-users and beneficiaries of the WATERUN SSWM Toolbox</li> <li>Identify requested experiences for the end-users and beneficiaries of the WATERUN SSWM Toolbox</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>Core Group/Board Members of the LSB in Santiago de Compostela and Aarhus</li> <li>Relevant Invitees/Visitors</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>What features should the WATERUN SSWM Toolbox (online version of the KER Guidance) have and what benefits should the toolbox create?</li> <li>What experiences should the WATERUN SSWM Toolbox create?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>Introduction &amp; Agenda</li> <li>Presentation of the ISB4 meeting insights</li> <li>Value Proposition Canvas workshop (2/2): Features, Benefits, Experiences of the SSWM Toolbox</li> <li>Conclusions &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>KO1: Documentation of feedback gathered from participants related to the guiding questions</li> <li>KO2: Internal Report on the results of the event for the corresponding WATERUN project partners</li> <li>KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

### VIM3: Focus on Policy Brief

Expected implementation month: September 2025

Key partners: WAREG, as the author of the policy brief

*Table 39: Intercity Virtual Meeting 3:*

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>Identify opportunities to align WATERUN policy brief with the needs, wants and capabilities of local authorities</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>Core Group/Board Members of the LSB in Santiago de Compostela and Aarhus</li> <li>Relevant Invitees/Visitors</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>How can the relevance of the WATERUN policy brief in light of the needs, wants and capabilities of local authorities be increased?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>Welcome &amp; Introduction</li> <li>Presentation of key messages from the (draft) policy brief</li> <li>Discussion in focus groups: improved alignment with needs, wants and capabilities of local authorities</li> <li>Short plenary presentation of discussion insights</li> <li>Conclusion &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>KO1: Documentation of feedback gathered from participants related to the guiding questions</li> <li>KO2: Internal Report on the results of the event for the corresponding WATERUN project partners</li> <li>KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

## 5.4.6 LIE, LSB – ISB Meetings

LSB-ISB Exchange (LIE) are virtual meetings between both LSB and the ISB. These are organised to integrate the common interests and share the experiences enabling the identification and implementation of best measures to manage UWR.

In total, there will be 2 LSB-ISB Meetings. The following lines describe each of them.

### **LIE1: Focus on KER (Guidance for methodological implementation of WATERUN UWR management)**

Expected implementation month: June 2025

Key partners: Polytechnical University of Marche -UNIVPM, leader of WP5 and AIMEN, Project Coordinator

*Table 40: LIE1, LSBs and ISB exchange meeting 1:*

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Identify relevant features, benefits of the end-users and beneficiaries of the WATERUN KER</li> <li>▪ Identify requested experiences for the end-users and beneficiaries of the WATERUN KER</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Core Group/Board Members of the LSB in Santiago de Compostela and Aarhus</li> <li>- Core Group/Board Members of the ISB</li> <li>- Relevant Invitees/Visitors</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• What features should the WATERUN KER have and what benefits should the toolbox create?</li> <li>• What experiences should the WATERUN KER create?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>- Introduction &amp; Agenda</li> <li>- Presentation of the ISB4 &amp; VIM2 Results</li> <li>- Value Proposition Canvas workshop: D5.6 (Description of KER)</li> <li>- Conclusions &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Documentation of feedback gathered from participants related to the guiding questions</li> <li>- KO2: Internal Report on the results of the event for the corresponding WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

## **LIE2: Focus on KER (Guidance for methodological implementation of WATERUN UWR management)**

Expected implementation month: February 2026

Key partners: Polytechnical University of Marche -UNIVPM, leader of WP5 and AIMEN, Project Coordinator

*Table 41: LIE 2, LSBs and ISB exchange meeting 2:*

Key Aspect	Description
Objective of the co-creation workshop?	<ul style="list-style-type: none"> <li>▪ Identify opportunities to improve the WATERUN KER (D5.6)</li> <li>▪ Identify key aspects for the exploitation roadmap beyond the WATERUN project Scope</li> </ul>
Target audience	<ul style="list-style-type: none"> <li>- Core Group/Board Members of the LSB in Santiago de Compostela and Aarhus</li> <li>- Core Group/Board Members of the ISB</li> <li>- Relevant Invitees/Visitors</li> </ul>
Guiding questions to be answered	<ul style="list-style-type: none"> <li>• How can the first draft of the WATERUN KER (D5.6) be improved?</li> <li>• What are key aspects to consider continuing the increase of TRL beyond the WATERUN project scope?</li> </ul>
Draft agenda	<ul style="list-style-type: none"> <li>- Introduction &amp; Agenda</li> <li>- Presentation of the draft version of D5.6</li> <li>- Review Workshop: D5.6 improvements</li> <li>- Conclusions &amp; Next Steps</li> </ul>
Key Outputs	<ul style="list-style-type: none"> <li>- KO1: Documentation of feedback gathered from participants related to the guiding questions</li> <li>- KO2: Internal Report on the results of the event for the corresponding WATERUN project partners</li> <li>- KO3: External report on the event with an executive summary for the local stakeholders</li> </ul>

## 6 RISK MITIGATION PLAN

In light of the increasingly volatile situation in the Middle East, a stronger emphasis has been placed on risk management, especially considering the ISB activities, which were initially strongly centred around Jordan. The following risk mitigation plan has been developed and is being implemented for WP1 activities and can be seen as a complementation to the list of critical risks shared via the DoW.

*Table 42: Proposed risk mitigation measures:*

Description of risks	Proposed risk mitigation measure(s)
Political instability leading to travel restrictions to and from the Middle East	1 - Add flexibility related to the format of the ISB meetings: Depending on volatility of the situation, switch to online or hybrid formats
	2 – Where possible, post-pone physical meetings in Jordan to be held in 2025 or later
	3 – Widen the target audience for the ISB to include stakeholders that are not based in the Middle East

## 7 KEY OUTPUTS FROM IMPLEMENTED CO-CREATION ACTIVITIES

### 7.1 LSB1 Santiago de Compostela



*Figure 11 Group picture of the participants of the LSB1 meeting in Santiago de Compostela*

#### About the event:

On March 3, 2023, the WATERUN Co-creation Committee of Santiago de Compostela was launched. During the launch event, basic designs of innovative WATERUN solutions for sustainable stormwater management in European cities were presented. Participants were asked to share their initial ideas with WATERUN project consortium members on specific aspects of usability, feasibility, and scope of the various solutions. The launch day concluded a week of preparatory meetings aimed at informing and engaging local stakeholders. All attendees were briefed on the new proposal to revise the European Directive on urban wastewater treatment.

#### Participants:

- Mónica Velo Cid, Augas de Galicia (female)
- Judith Ponceth, Augas de Galicia (female)
- Manuel Álvarez Cortiñas, Sergas
- Paula, Sánchez García, Sergas (female)
- Rocío Montañés, Concello de Santiago (woman)
- Pablo Martín, Concello de Santiago
- Miguel Fernández, Concello de Santiago
- Ana Tejeiro, Viaqua (female)
- Leticia Rodríguez Hernández, Viaqua (female)
- Francisco Carballo, E3 Arquitectos

#### Activities:

- A presentation by Prof. Joaquín Suárez López from the University of A Coruña, introducing participants to stormwater management and diffuse pollution.
- A Marketplace session where members of the Co-creation committee were acquainted with WATERUN Products.
- A round of discussions regarding the products using an adaption of the “discussion forums” tool
- Presentation of the WP4 pilot in Spain.



*Figure 12 Co-Creation Activities during LSB1 in Santiago de Compostela*

### Key Outputs

Key outputs consisted of the documentation of an initial recollection of feedback from key local stakeholders in the form of “gains” and “pains” expressed when confronted with the early design of the WATERUN OERs/KER. Results were consolidated and shared with WATERUN project partners and the event participants. A brief overview of the feedback can be found in the summary table below the next section.

## 7.2 LSB1 Aarhus



*Figure 13 Group picture of the participants of the LSB1 meeting in Aarhus*

On May 24th, 2023, the inauguration of the Aarhus WATERUN Co-creation Committee took place. Similar to the Santiago de Compostela event, the central focus of the launch event in Aarhus was the introduction of preliminary designs for innovative WATERUN solutions aimed at fostering sustainable stormwater management in European urban areas. Attendees were encouraged to provide their initial insights to members of the WATERUN project consortium regarding the usability, feasibility, and scope of these solutions. Additionally, all participants received information about the proposed revision of the European Directive concerning urban wastewater treatment.

### Participants

- Solvei Mundbjerg Jensen, Syddjurs kommune (woman)
- Francisca Braga, Skanderborg Kommune (woman)
- Morten Rebsdorf, Aarhus Vand

- Malte Kristian Skovby Ahm, Aarhus Vand
- Gitte Normand Andersen, Municipality of Aarhus (woman)
- Nikolaj Kruse Christensen, Municipality of Aarhus
- Uffe Linneberg Gangelhof, Vand Center Syd (Odense)

### Activities

- Introduction to WATERUN
- Brief introduction to the WATERUN Solutions
- WATERUN Solution Booths and Feedback based on the “discussion forums” tool
- Conclusions & Next Steps



Figure 14 Co-Creation Activities during LSB1 in Aarhus

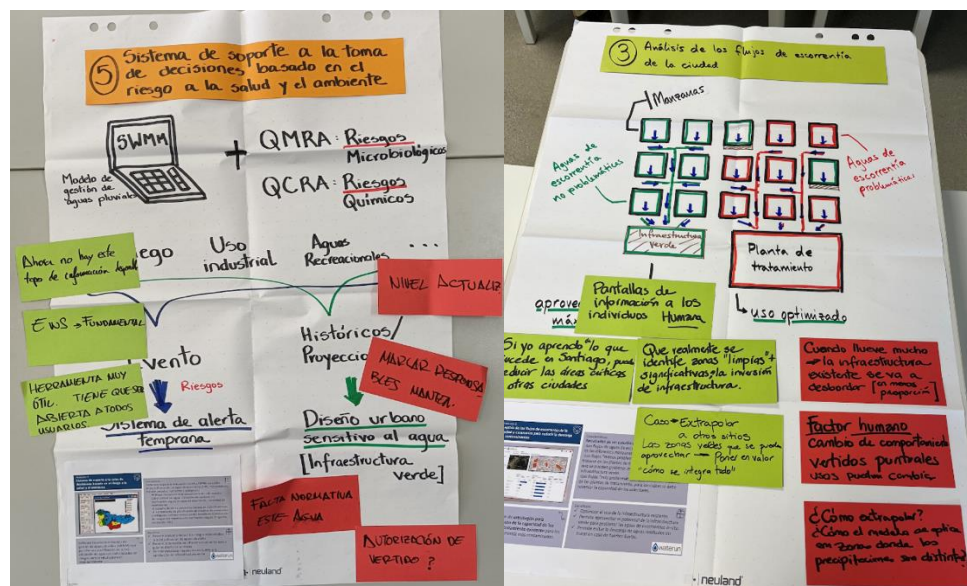


Figure 15 Examples of the prototype mock-ups and documented feedback (green = gains, red = pains)

### Key Outputs

Key outputs consisted of the documentation of an initial recollection of feedback from key local stakeholders in the form of “gains” and “pains” expressed when confronted with the early design of the WATERUN OERs/KER. Results were consolidated and shared with WATERUN project partners and the event participants. A brief overview of the feedback can be found in the summary table below:

Table 43: Summary of feedback collected during LSB1 in Santiago de Compostela and Aarhus:

WATERUN Solution	Pains: What challenges and risks do you perceive and what doubts do you have when learning about the solution?	Gains: Which features of the solution would delight you?
OER1 Advanced Monitoring Solution	<ul style="list-style-type: none"> <li>• There is a fear that the analysis is not correct, and the sample is not representative. It may be influenced by incorrect sampling by an unqualified person for incorrectly locating the sensor.</li> <li>• There is a fear of possibility of cross-contamination if the device is not cleaned and managed correctly.</li> <li>• “Easy” might bring some problems with potential interference. How to deal with samples containing organic matter? Samples, from which we are going to obtain, for instance pH, might be contaminated.</li> <li>• How to ensure accuracy, when we are going to have samples containing very low concentrations? We might need to conduct a pre-treatment of samples; this might not be so good for on-site practical purposes.</li> <li>• Also, about accuracy, we might not be able to show exact concentrations (e.g. 50 ppm), but only give some ranges (such as the sample is between 100ppm and 200 ppm). If accuracy is needed, the system might not be the answer.</li> <li>• Authorities might be skeptical to adopt this technology, but it might be a good technology for operators working in utilities. If utilities are happy with the technology, that could be an entry point to advocate to authorities.</li> <li>• Cost vs need. How really urgent is to know the concentration on-site?</li> <li>• There will be different concentrations depending on the time.</li> </ul>	<ul style="list-style-type: none"> <li>• The system should allow for analysis of dry samples (microplastics) to determine contamination concentrations without having the need to wait for a heavy rainfall event.</li> <li>• Citizen science: the system should allow for involving citizens in detecting problem spots for early warning using an application that shows places that could be contaminated. This will allow the water management company to identify through a photo sent by the user if a site analysis is needed.</li> <li>• We should look for options to exporting/transferring the devices to developing countries as an inexpensive means of monitoring</li> <li>• This could give a very quick answer on-site and therefore work as an Early Warning System. For instance, using the system, we can obtain a sample with a very large concentration, against another sample with a lower concentration. That would tell us when we need to take action.</li> <li>• It has to be a really easy tool that can be really used on-site.</li> <li>• There should be an understanding that “real time” means “measuring here and now”.</li> <li>• About portable analysis: maybe we don’t need to measure it on-site, but only take the samples and bring to a lab and process them in the lab, as opposed to having a really complicated method to do in the lab.</li> <li>• The system should be easy enough to allow for many samples to be processed in the laboratory.</li> <li>• This should be thought as a screening tool and supplement for the quality control process that utilities conduct.</li> </ul>
OER2 CleanCityCover	<ul style="list-style-type: none"> <li>• The software, besides considering surfaces, should identify the pollution caused by human activities.</li> <li>• There is a fear caused by the need of constant up-dating.</li> <li>• Even though the information is valuable, authorities think there is a lack of resources to implement mitigation/remediation measures.</li> <li>• Validity of the results: precision of concentration/amount. How are we going to link with the monitoring group to check if what we think it is coming from the surface is actually what the monitoring team in measuring?</li> </ul>	<ul style="list-style-type: none"> <li>• It should be open source.</li> <li>• It should include industrial and commercial sectors.</li> <li>• It should be replicable.</li> <li>• It should help to identify emergent contaminants.</li> <li>• This tool could be used or could help in the process of issuing permits on surface usage.</li> <li>• The system should have an “uncertainty measure”, because the result will not be certain. But also, this will be an iterative process for future end data validation.</li> <li>• User friendly for citizens: different displays for different users.</li> </ul>

	<ul style="list-style-type: none"> <li>• Difficulty in communicating uncertainty in a map-based tool. Quality of data is a concern.</li> <li>• Dependency on the recipient (if something is toxic or not).</li> <li>• The software will be accompanied by a manual with lots of information for users to read and instruction to follow. However, people are not interested in reading manuals. So, the team will have to think on a form to make it simple to understand.</li> <li>• It will be hard to tackle all the the pollutants. Maybe it will be easier to start with 3 or 4 pollutants and see how it can be handled.</li> <li>• The team has been concentrating on understanding the sources of the pollution but not really where the pollution is going. There should be a better understanding of where the storm water goes to (is it a river?Lake?, etc.).</li> <li>• Difference in pollutants and concentrations depend on rainfall characteristics.</li> </ul>	<ul style="list-style-type: none"> <li>• The tool should cater the different levels of knowledge of the users. For instance, there could be two displays, a very simple one version with key information, and then an advanced one for people who actually know. This advanced version could show the data in different years, pollutants, ranking, etc.</li> <li>• Inclusion of groundwater data in the map.</li> <li>• Inclusion of sediment transport.</li> <li>• Linkage of pollution data and geodata.</li> <li>• Information on concentration of pollutants.</li> </ul>
OER3 Must-B	<ul style="list-style-type: none"> <li>• Human factor: the runoff water analysis map can change abruptly if users change, at a given time, their activities and discharges, increasing concentrations of those runoff considered “clean”.</li> <li>• Possibility of failing the dimensioning of the green infrastructure. When it rains significantly the green infrastructure that treats the “clean runoff” could overflow.</li> <li>• It should not stay as an academic exercise. Authorities see a great potential as a tool for citizens’ behavioural change. Therefore, there is a need to develop knowledge communication strategies to make people aware of the impact of pollution caused by their activities, thus generating a change in citizens behavior.</li> <li>• How to extrapolate the results obtained for Santiago to different territories in Galicia and how the model would be applied to areas where rainfall is different.</li> <li>• The tool should consider a “quality” criteria for the water runoff, not only quantity (flows). This relates to the question asked in one of the red cards: What is the starting point scenario with quality criteria?</li> <li>• Local conditions must be considered, including seasonal changes. Also, groundwater levels should be considered. This all depends on local conditions, such as soil absorbing capacity.</li> <li>• Inputs and outputs of this tool should be “open sources”.</li> <li>• What would be the quality of the data? Access to data is scarce.</li> <li>• Include other solutions besides Natural Based Solutions (NBS). For instance, depending on the local conditions, the system could offer</li> </ul>	<ul style="list-style-type: none"> <li>• Possibility of contributing to behaviour change: the analysis should produce “information sheets” in the form of graphics / infographics aimed at citizens and encouraging a change in their behavior. The aim should be to raise awareness among citizens of their own contribution to runoff pollution.</li> <li>• The identification of more significant clean areas that have the potential for new green infrastructure investments. This helps with investment planning, specially of much desired green infrastructure that can be integrated in green areas, maximising their value.</li> <li>• Critical areas in other cities can be deduced based on previous analyses obtained in Santiago.</li> <li>• It is good to have a simple manual with a set of rules, instead of a more complicated program since an automatic tool could be too difficult for an end-user.</li> <li>• Focus on both flow and quality of the storm water runoff.</li> <li>• The results should tell me when to use NBS to increase the capacity of existing system to deal with urban runoff.</li> <li>• The system should give different NBS options-based scenarios with quality criteria. What type of quality would you expect from the NBS, for instance, based on type of catchment area. This should include factors indicating the different NBS: how well do they operate?</li> <li>• The results should be used for real-time scenario calculations in planning workshops with stakeholders. The aim is to reduce calculation times and make it simple for stakeholders to brainstorm and discuss. An advisor</li> </ul>

	<p>solutions such as more centralised detention basins to achieve a better overall performance of the system.</p> <ul style="list-style-type: none"> <li>• How effective are NBS to reach EU standards? Are we in the right direction?</li> </ul>	<p>will be able to do the first part (model block) and then, the solutions could be assessed during a workshop (scenario analysis).</p> <ul style="list-style-type: none"> <li>• It should also say the possibility of reusing treated water.</li> <li>• Include CAPEX and OPEX.</li> <li>• The system should also mention benefits, going beyond the economic factors to engage citizens.</li> </ul>
OER4 DSS for WSUD	<ul style="list-style-type: none"> <li>• Currently, there is not a legal framework that specifically regulates water runoff. Therefore, there are many open questions about norms to regulate the discharge and/or use of runoff and the use of water sources affected by it.</li> <li>• It is not clear who is responsible of using, updating a maintaining such a DSS.</li> <li>• There are too many assumptions, that causes that the certainty and reliability of the model is questionable. At least, there should be a message saying that this is only a model and there might be some difference to reality.</li> <li>• How do you complement this approach with real-time data, especially when we talk about health risks, we should be sure that there are not dangers for citizens.</li> <li>• Temperature is something that should be incorporated. Besides microbiological and chemical risks, physical risk, such as Temperature should be also be part of the risk assessment.</li> </ul>	<ul style="list-style-type: none"> <li>• Authorities highly appreciated the Early Warning System. Currently, this information is not available, and it is not possible to take decisions to restrict the use of water sources depending on the contamination of the incoming runoff.</li> <li>• The tool should be open to all type of users (regional policy maker, water regulator, health regulator, municipality, water utility and citizens).</li> <li>• The information should be easily accessible and adapted to the type of reader. In particular, citizens should be aware of the health risks associated to the water use.</li> <li>• The system should be integrated to a systemic view, such as the water cycle. The two analytical approaches, EWS and DSS should be related with each other.</li> <li>• It should serve as an application for the protection of water bodies.</li> <li>• The tool should be combined with real time data by means of remote sensing to increase reliability.</li> <li>• The tool should focus on a small set of parameters to avoid capturing too many at once. Data collection should be simple, comprehensive and systematically.</li> <li>• The tool should take into account the different areas of pollution (industrial, residential and others), as well as the micro-climates of the city.</li> <li>• The tool should be combined with hydrological models used for managing recreational use.</li> <li>• The system should tell about the chemical risks associated to bathing. Therefore, there should be a bathing water monitoring.</li> <li>• The system should present standardised reuse scenarios and define risk-free reuse.</li> <li>• The tool should indicate where it is safe to harvest rain/storm water, and as such, act as a planning tool.</li> <li>• It would be great to integrate this DSS and the product 2 (CleanCityCover, prepared by TUB).</li> <li>• The tool should be compatible with all WATERUN tools. The tools should be integrated into a standardize approach, making sure there is one approved way.</li> </ul>

KER	<ul style="list-style-type: none"> <li>• There is a fear that the guide could be too difficult to read and too technical. This may affect the number of people interested in reading it.</li> <li>• Authorities have the concern that future users of the guide will not be consulted during the preparation of the contents. They would like to give recommendations.</li> <li>• Information will be very difficult to find.</li> <li>• Too many pieces of information.</li> </ul>	<ul style="list-style-type: none"> <li>• The guide should be designed considering the users' profiles. It should show different contents according to who is using it.</li> <li>• Urban planning factors according to different regions and countries. The guide should provide solutions for large populations as well as smaller populations in different environments.</li> <li>• It should include recommendations to assign responsibilities (e.g. who should manage and operate the green infrastructures), as well technical and policy guidelines.</li> <li>• User-friendly and easy to read.</li> <li>• Printable PDF and online format.</li> <li>• It should include information on the types of pollutants, the type of soils, and their treatments. It should also consider the mapping of the territories and their population.</li> <li>• It must consider CAPEX and OPEX costs.</li> <li>• The guideline should be operational, therefore it should be simple to find the knowledge that the consortium has produced. Therefore, stakeholders propose that there should be a quick overview to make it clear what are the contents of the guide.</li> <li>• There should be different ways to access the information.</li> <li>• It should be user-friendly, keep it short and simple.</li> <li>• It should be open access.</li> <li>• There should be protocols on how to use each WATERUN product. They need to be easily accessible, with not too many technical vocabulary.</li> <li>• There should be recommendations about how to work more holistic in the water cycle (short and long term).</li> <li>• Information should be organised by products.</li> <li>• The tool should be online but there should be a possibility to download the manual.</li> <li>• The manual should have examples.</li> <li>• There should be a common guideline across more EU-projects.</li> </ul>
GI Design (WP4)	<ul style="list-style-type: none"> <li>• There are concerns about the economic costs of maintenance and management of the pilot plants. It is also not known exactly who would oversee this maintenance.</li> <li>• Authorities ask about the life-span of the treatment plants (how long they last?). Besides, they would like to know what to do with the systems, and the Phyto and inert material, once exhausted. It is necessary to research innovative methodologies from a circular economy perspective to valorise and/or reuse these materials so that they are not considered as hazardous waste.</li> </ul>	<ul style="list-style-type: none"> <li>• The pilots should include water reclamation and reuse schemes.</li> <li>• The pilots should be accompanied by a solid waste management plan.</li> <li>• The wetland should be vertical, so it doesn't look like a fish farm.</li> <li>• To ensure the survival of the Phyto species and the efficiency of the systems, there should be a mechanism to control temperature.</li> <li>• The treatment plants should be integrated to the urban landscape.</li> <li>• The system should have a good anti-theft system.</li> <li>• The exhausted filter material should be reused.</li> <li>• We can get synergies from this type of systems, and we can integrate them to the infrastructure that already exist.</li> </ul>

	<ul style="list-style-type: none"> <li>• The species selection process should consider the level of adaptability of the plant species so that they have a high survival rate (e.g. some of the effluents could reach a Temp of 70 °C).</li> <li>• Because of the location of the pilots (in an industrial area), there may be risks of theft.</li> <li>• The green infrastructures seem to be not too flexible.</li> <li>• They take up a lot of space.</li> <li>• Whenever you do a NBS, for instance a wet pond, and you start excavating, the water table changes. This can affect the local urban infrastructure.</li> <li>• One thing that we must take into consideration is the Phosphorus limit. One concern is the Phosphorus leaching to natural waters, because P removal in this type of systems can be limited. This means that we need to find a way to optimise P removal.</li> <li>• In general, nutrients removal during summer should be looked into.</li> <li>• If you have a wet pond, for instance, it is going to be green and maybe the neighbours will not like. So, we need to work on social acceptance.</li> </ul>	<ul style="list-style-type: none"> <li>• Users, who will be near the NBS system, should participate in the decision-making process during the design of the system.</li> <li>• One feature which is desired is monitoring. We should be able to monitor several pollutants and screen for all emergent pollutants.</li> <li>• We should measure Temperature in outlet / inlet. Temperature (T) is an issue, particularly for Municipalities, because T has an effect on the receiving natural water bodies. If we compare sub-surface systems with wet ponds, this last will be higher, and we might not be able to simply discharge, as there are limits set in the standards. But the fact that sub-surface systems can maintain the T low before discharging was seen as a positive feature.</li> <li>• WATERUN should give us new data related to effluent quality, as it will run the next 3 years. It is very seldom that we find regular, consisting and continuous data from these systems. This can help us to create guidelines and solutions for treating urban runoff.</li> <li>• WATERUN should help us understanding performance, for instance, the level of removal of heavy metals. This can help us to prepare a “pollutants catalog” for Aarhus of what could be treated with these systems.</li> <li>• WATERUN should help us preparing design criteria for NBS systems and permits, indicating how to meet effluent standards.</li> </ul>
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### 7.3 LSB2 in Santiago de Compostela

The event on February 22nd, 2024, focused on the analysis of OER4. During the workshop, a collaborative analysis was facilitated using a co-creation and marketing method called "user journey map" applied to the UNIVPM DSS (Decision Support System) tool to achieve the following objectives: Introduce participants to OER4 in-depth; Obtain feedback on the tool's functionality (Focus on Health Risks); Get feedback on the value, usability, and cost-benefit ratio of the tool; Update the audience on the progress of the pilot project in Tambre and A Sionlla.

#### Participants:

- Judith Ponceth, Mónica Velo Cid, Aguas de Galicia
- Manuel Álvarez Cortiñas, Paula Sánchez García, Sergas
- Pablo Martín, Rocío Montañés, Concello de Santiago
- Ana Tejeiro, Leticia Rodríguez Hernández, David Permui, Viaqua
- Sergio Santorio, Cetaqua
- Santiago Cuervo, Raquel Pérez, Luz Herrero, Aimen
- Angélica Goya, UDC
- Francisco Carballo, E3 Arquitectos

#### Activities:

- Presentation of the UNIVPM DSS Tool (Francesco Fatone)
- Presentation of the Cupra Marittima Case Study (Lucia de Simoni)
- Collaborative Analysis of the "user journey" of the UNIVPM DSS Tool
- Concluding discussion related to value, usability, and cost-effectiveness of the tool from the point of view of the participants.



Figure 16 Co-Creation activities during LSB2 in Santiago de Compostela

Key Output 1: User journey analysis:

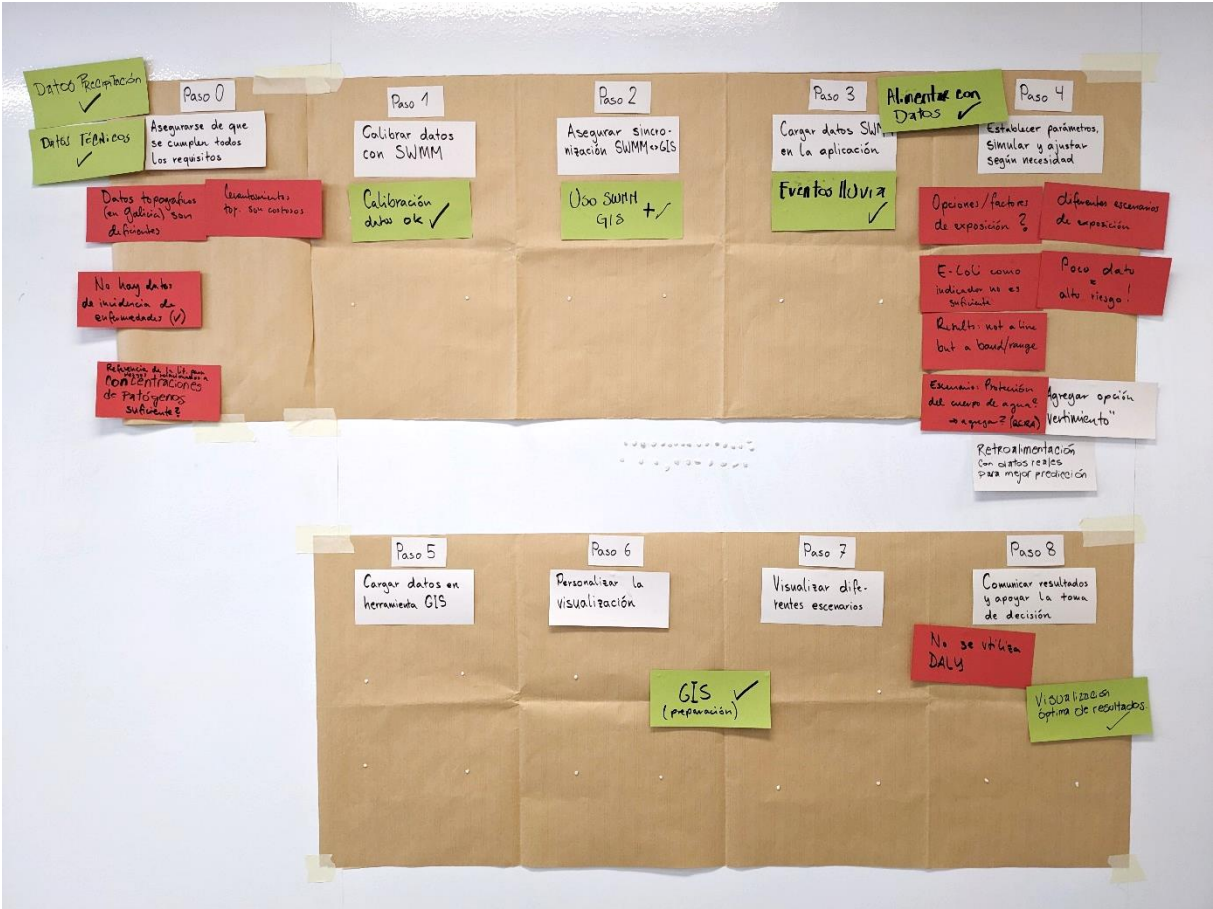


Figure 17 Documented feedback gathered from participants in relation to the LSB2 meeting in Santiago de Compostela

Participants were introduced to the UNIVPM DSS tool, followed by an introduction to the Cupra Marittima case study. Later, they were systematically guided through the application of the UNIVPM DSS tool. Participants were encouraged to share their thoughts and concerns regarding the various prerequisites, functionalities, and capabilities of the tools. Participants' feedbacks were mapped against a generic, step-by-step user journey map to capture key comments, concerns, as well as points raised by the participants corresponding to each step.

Feedback from participants are summarized in the table below.

Table 44: Feedback from LSB Santiago de Compostela members related the UNIVPM DSS "User Journey":

Red	Major concerns	Orange	Minor concerns	Green	No concerns
Generic Step		Feedback		Detailed description and seecon comments	
0. Make sure all requirements are met	High-quality topographical data as input for the SWMM are deficient or difficult/costly to get		AGUAS DE GALICIA: Aguas de Galicia highlighted the fact that the available topographical data on the relevant catchment area in the case of Santiago de Compostela is not complete and only partially updated. Due to the relatively high cost of the topographical survey, the data is currently incomplete		
	Lack of data regarding incidence of diseases (ok)		This issue was raised and later resolved thanks to a clarification from the UNIVPM team		
	Doubts regarding the reliability of the literature references for deduction of pathogen concentrations		SERGAS: SERGAS expressed their concern regarding the level of reliability of the references for the deduction of pathogen concentrations that stem solely from literature and based on a conversion factor. SERGAS expressed their doubt regarding the extent by which these references are valid for particular application cases.		
1. Use SWMM to calibrate the required data	No doubts/concerns raised		AGUAS DE GALICIA: expressed that they are very familiar with SWMM. Generally, the participants agreed that enough technical know-how was available locally to implement these steps and they did not express any concerns considering that the entire process would have to be implemented with a multi-disciplinary group.		
2. Prepare the data for synchronisation between SWMM and GIS	No doubts/concerns raised				
3. Load my SWMM data into the Python application	No doubts/concerns raised				
4. Set all parameters, run simulations, and make adjustments where necessary	Different exposure options		AGUAS DE GALICIA: Aguas de Galicia expressed their concern in terms of the different exposure options (garden irrigation, municipal irrigation and toilet flushing). Depending on the user segment, context, situation, time of the year, etc. the exposure scenarios can be very different. Here, Aguas de Galicia expressed their doubts as to what extent the wide range of different exposure scenarios can be adequately captured in the reuse options provided by the tool. Also, participants mentioned that it would be more relevant to have the option “discharge in the environment -or water bodies-“, as it is the most common in Galicia.		
	Risk of using E.Coli as only indicator for presence/concentration other pathogens		SERGAS/AGUAS DE GALICIA: This concern was raised twice.		

	Reliability of data in light of availability of the data	AGUAS DE GALICIA: Aguas de Galicia expressed their concern regarding the low level of data availability for the presence/behaviour of concentrations of pathogens and the related reliability of the risk scenarios.
	Graphical display of the risks in the results windows	AGUAS DE GALICIA: Aguas de Galicia expressed their concern with the display of the results of the scenario analysis in DALY. The current display may suggest too much certainty and it was suggested to use a shaded error band (or a thicker line).
	Lack of “disposal” scenario in “Exposure Options”	CETAQUA: While the added value of analyzing different reuse scenarios was acknowledged, CETAQUA expressed concerns regarding the lack of options to analyze disposal scenarios as part of the “Exposure Options”. This is related to one of their main concerns, namely their mission to protect water bodies. CETAQUA requested to include an option for the tool to support decision-making in reference to compliance thresholds in disposal scenarios and related environmental risks.
	Lack of possibility to feed the model with real data for better prediction	AGUAS DE GALICIA: Aguas de Galicia expressed their concern regarding the (apparent) lack of possibilities to feed real data back into the model or to increase the reliability of the predictions - especially for bathing water quality for particular rain events.
	Relevance of DALY in Santiago de Compostela	SERGAS: SERGAS expressed their concern related to the DALY indicator as the participants were not aware of DALY being used as a key indicator by SERGAS at the moment.
5. Load data into the GIS tool (shapefile format)	No doubts/concerns raised	Generally, the participants agreed that enough technical know-how was available locally to implement these steps and they did not express any concerns considering that the entire process would have to be implemented with a multi-disciplinary group
6. Customize GIS visualisation (color)	No doubts/concerns raised	
7. Visualize different scenarios	No doubts/concerns raised	
8. Communicate results and support decision-making	No doubts/concerns raised	

## Key Output 1: Value proposition, usability and cost-benefit relation

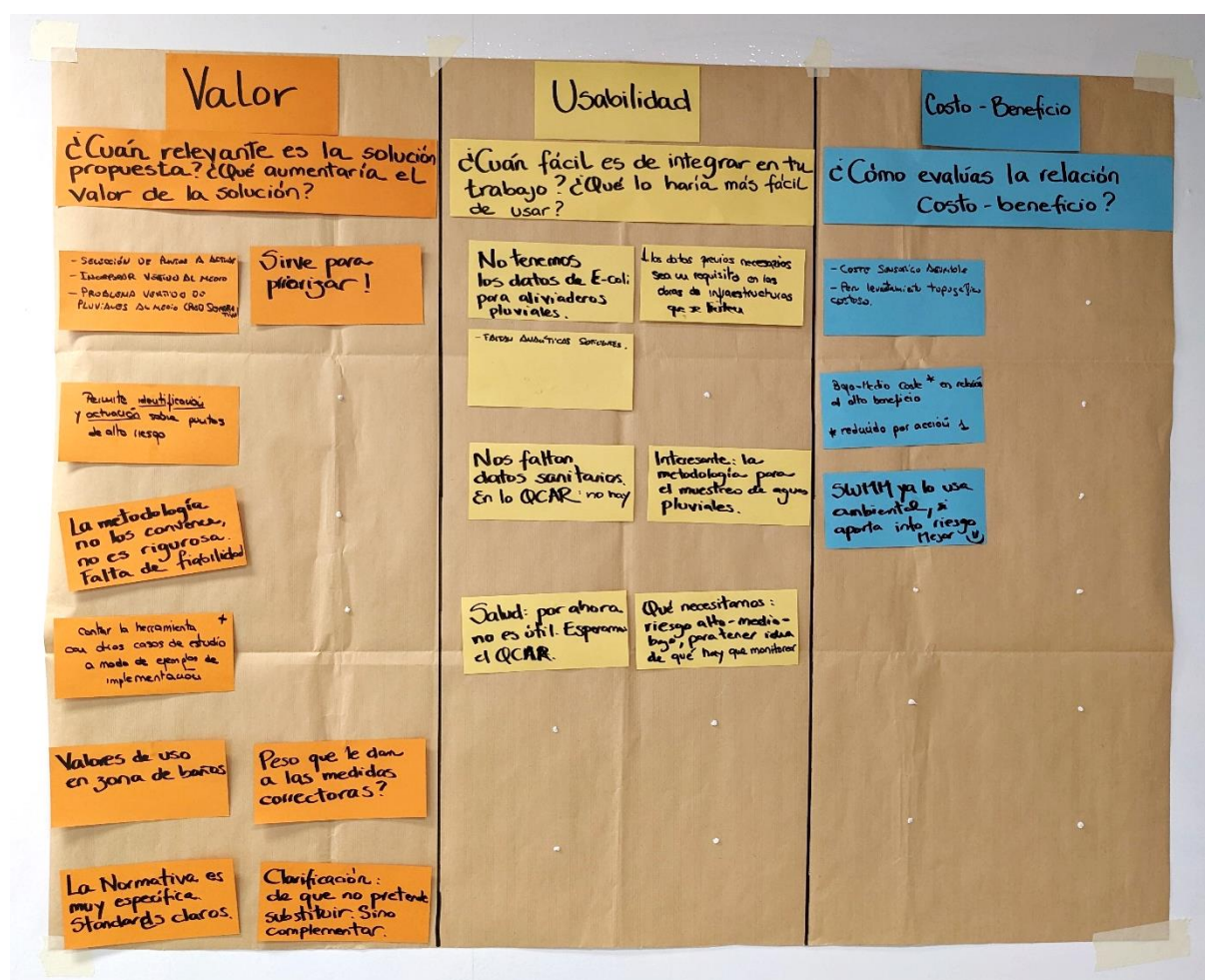


Figure 18 Documented feedback gathered from participants related to the value proposition, usability and perceived cost-benefit ratio of the DSS tool

After a thorough discussion of each step in the customer journey, participants were encouraged to share their feedback on the value proposition, usability, and the cost-benefit ratio of the proposed tool.

Results are summarized below:

Table 45: Summary of feedback on Value Proposition, Usability, and Perceived Cost-Benefit Ratio of OER4:

Question 1: Value proposition
How relevant is the proposed solution? What would enhance the value of the solution?
The participants appreciated the tool's added value, emphasizing its ability to prioritize critical points in the network and support informed planning decisions.
A noteworthy suggestion was made regarding the enhancement of the added value, by incorporating disposal scenarios, particularly emphasizing its significant value for addressing a key concern of the local decision-maker.
Linked to the above-mentioned point, participants highlighted the potential of increasing the tool's value by making it more easily applicable to separated sewer networks.

Participants expressed challenges in aligning and assessing the tool with the local regulatory requirements of Santiago de Compostela/Galicia. They noted that a better understanding of how the tool aligns with the local framework would facilitate the assessment of its value proposition.

The methodology did not fully convince Aguas de Galicia, primarily highlighting questions regarding the thoroughness of the methodology of the tool and the reliance on a perceived high number of assumptions.

To improve the value of the tool, a suggestion was made to establish a repository of case studies, providing users with real historical data from other cases to gauge the effectiveness of different treatment options and scenarios.

Another identified value addition was the tool's potential to focus more strongly or explicitly on the thresholds required for safe bathing water and the corresponding appropriate treatment measures.

Stakeholders emphasised the importance of understanding how the tool weighs different treatment options in scenario simulations to enhance their comprehension.

### **Question 2: Usability**

*How easy is it to integrate into your work? What would make it easier to use?*

There was emphasis on the partial lack of the required data to apply the tool in Santiago de Compostela. This is particularly notable related to the topographical surveys and in the analysis of pathogens and their concentration for specific settings. While data exists for disposal points and events, there is a lack of data for specific overflow nodes during default or normal states. Key concerns from the perspective of health and environmental authorities revolved around the unavailability of high-quality data, especially for Quantitative Microbial Risk Assessment (QMRA).

In the context of Santiago de Compostela, the usability of the tool was perceived as somewhat limited due to the city's implementation of separated sewer networks.

### **Question 3: Cost-benefit ratio**

*How do you evaluate the cost-benefit relationship?*

Primary concerns regarding the cost-benefit ratio centred on the substantial expense associated with conducting a comprehensive topographical assessment study. However, if a resolution is found for the topographical survey issue, and the costs can be covered through an alternative budget or funding source, the cost-benefit ratio was perceived as favourable.

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