SCOREwater

Smart City Observatories implement REsilient Water Management

DELIVERABLE D4.3

INPUT TO TESTING PHASE REGARDING IMPLEMENTING TECHNOLOGIES FOR WATER MANAGEMENT

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ABBREVIATIONS

Abbreviation	Definition
CKAN	Comprehensive Kerbal Archive Network
ICT	Information and Communications Technology
IoT	Internet of Things
SDG	Sustainable Development Goals
SME	Small and Medium-sized Enterprise

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PROJECT ABSTRACT

SCOREwater focuses on enhancing the resilience of cities against climate change and urbanization by enabling a water smart society that fulfils SDGs 3, 6, 11, 12 and 13 and secures future ecosystem services. We introduce digital services to improve management of wastewater, stormwater and flooding events. These services are provided by an adaptive digital platform, developed and verified by relevant stakeholders (communities, municipalities, businesses, and civil society) in iterative collaboration with developers, thus tailoring to stakeholders' needs. Existing technical platforms and services (e.g. FIWARE, CKAN) are extended to the water domain by integrating relevant standards, ontologies and vocabularies, and provide an interoperable open-source platform for smart water management. Emerging digital technologies such as IoT, Artificial Intelligence, and Big Data is used to provide accurate real-time predictions and refined information.

We implement three large-scale, cross-cutting innovation demonstrators and enable transfer and upscale by providing harmonized data and services. We initiate a new domain "sewage sociology" mining biomarkers of community-wide lifestyle habits from sewage. We develop new water monitoring techniques and data-adaptive storm water treatment and apply to water resource protection and legal compliance for construction projects. We enhance resilience against flooding by sensing and hydrological modelling coupled to urban water engineering. We will identify best practices for developing and using the digital services, thus addressing water stakeholders beyond the project partners. The project will also develop technologies to increase public engagement in water management.

Moreover, SCOREwater will deliver an innovation ecosystem driven by the financial savings in both maintenance and operation of water systems that are offered using the SCOREwater digital services, providing new business opportunities for water and ICT SMEs.

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EXECUTIVE SUMMARY

This deliverable report part of subtask 4.1.2 (Iterative evaluations) and is the second in a series of evaluations through the project process. The purpose is to share and bring forward experiences in order to improve the implementation of technologies and services and how to demonstrate the SCOREwater platform.

Task 4.1.2, when complete, will summarize findings from the different phases and lastly from the evaluation phase. The different evaluations are done to collect information and lessons learned to use in the progress and provide input to every upcoming phase. For this phase, the evaluation is focusing on barriers and/or enablers for implementation in real environment in the three cities (experiences regarding for example deployment of sensors, set up of models etc).

The evaluation was carried out as a survey to all operational work package participants, 20 people answered it. The evaluation focus around three categories, organization, technical aspects and communication. The results show that there have been a few challenges in the implementation phase, mostly regarding engagement of partners, technical issues in the field and information between WPs. However, most of the respondents also think that communication and collaboration is working well in the project. One issue which is important to highlight and manage in the consortium is the lack of knowledge “cross-case”, that is between the three cases but also between WPs. The low number of people that knows what is happening in other cases than their own is something that needs to be improved in the project to strengthen the sharing of experiences. Some of the most important lessons so far are at first the complexity of large innovations projects like this, with many partners and many technical issues that can fail, but second the importance of the project and the need for digitalization in the water sector.

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1. PURPOSE AND AIM WITH DELIVERABLE

This deliverable is part of subtask 4.1.2 and is the second in a series of evaluations through the SCOREwater project. The purpose is to share and bring forward experiences in order to improve the implementation of technologies and services and how to demonstrate the SCOREwater platform.

Task 4.1.2, when complete, will summarize findings from the different phases and lastly from the evaluation phase. The different evaluations are done to collect information and lessons learned to use in the progress and provide input to every upcoming phase. For this phase, the evaluation is focusing on barriers and/or enablers for implementation in real environment in the three cities (experiences regarding for example deployment of sensors, set up of models etc).

The aim with this deliverable is to provide better conditions for the next phase, enable progress in implementation and thus to support the development, implementation and effective use of smart water management. This phase is focusing on barriers and/or enablers for implementation in real environment in the three cities (lessons regarding deployment of sensors, set up of models etc). The results can contribute to ensure development and improvement from the perspectives of both users and developers.

The deliverable reports the results from a survey sent out in order to evaluate the project process and is of type “other”.

2. BACKGROUND TO SECOND STEP OF EVALUATION

The first evaluation was carried out in the Spring of 2020 (M12) and was partly a trial for the evaluation format which was being tested. At that time not many activities were fully carried out in the project yet.

The first evaluation showed that collaboration, involvement of different perspectives and complexity of technical issues needed to be addressed to move forward to the next phases, as well as further analysed.

In the implementation phase was the Data Analytics and Machine Learning techniques (WP2) and the platform (WP3) were implemented for testing in the demonstration cases, including the adaptive deployment of sensors, algorithms, models as well as setting up processes for using the platform and the data (WP4), which are promoted through WP7. The phase ends with milestone 3 – Prototype verification. Due to the Covid-19 pandemic many activities within WP4 as well as other packages were could not be carried out according to plan. Thus a number of deliverables were delayed. With this background, this evaluation was postponed for a few months.

3. THE SURVEY

The evaluation was done through a web-based survey, questions can be found in Annex I. The survey was made in Microsoft forms and submitted to all partners known to be involved in operational WPs in the implementation phase in an email, in total 37 people received the email. The respondents had two weeks to answer. Two reminding emails was sent out. In total 20 people responded.

The focus in the evaluation are the key factors which may have hindered the process or enabled improvement in phases to come, as well as what works well and what can be improved. It is structured into three theme categories:

- Organization and planning
- Technical factors
- Collaboration and communication

Within these categories’ questions have been formulated in order to answer what aspects hinder or enables the project development. Some questions are scale-based which enables comparison with previous and coming evaluations.

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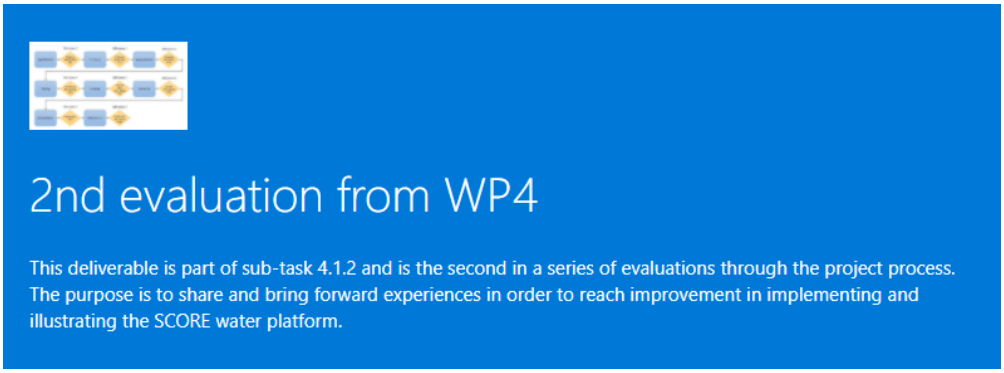
This evaluation uses updated questions and an increased number of open-answer-questions to get more in detail knowledge and feedback. The leaders for WP2, WP3, WP5, WP6 and WP7 have also been invited to provide input to questions before the evaluation was sent out. This to ensure that we don't miss important aspects to ask in the process.



4. RESULTS

In total, 20 respondents participated in the evaluation. All individuals' answers are anonymous and the figures present aggregated results. The representation of respondents is from all three demonstration cases. As in the first round of evaluation, the answers will be analyzed for potential development in the next steps and experiences can be used in order to improve the work.

4.1. ORGANIZATION AND PLANNING

This section is about barriers and/or enablers in aspects regarding the organization of the project, among partners and stakeholders as well as planning of project and activities within the project. The respondents were asked questions about organizational challenges and partnership arrangements.

Amongst the challenging organizational or planning aspects (see figure 1), the respondents mention for example the Covid-19 pandemic which caused many activities to a halt for a period and then resulted in several delays. The delays also effected other activities which in some cases were delayed as well.

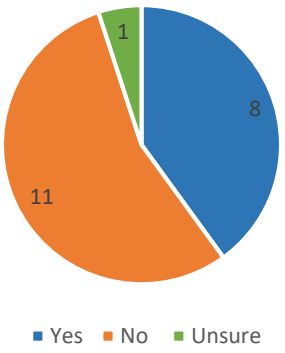


Figure 1: Have you experienced organizational or planning aspects as challenging (hindering progress and/or development) in the implementation phase?

However, Covid-19 also created new opportunities. For example, in Barcelona, partners expanded the targets of the case study to also include viral load levels in the sewage from the neighborhoods and substantially increased prominence of wastewater-based epidemiology both within the scientific community and to a lower extent with the general public.

Next to the challenges in the implementation phase mentioned above, the participants also referred to other challenges:

1. The large consortium with many involved partners is mentioned as sometimes challenging. The importance of regular meetings to discuss plans and progress is emphasized.

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2. In Amersfoort it is seen as a challenge to match citizen science with the project.

> *"it has proven to be challenging to match citizen science with a European project. The latter requires detailed planning, whereas the former thrives on spontaneous initiatives. We regularly meet to discuss progress based upon shared vision / goals to ensure that these are aligned."*

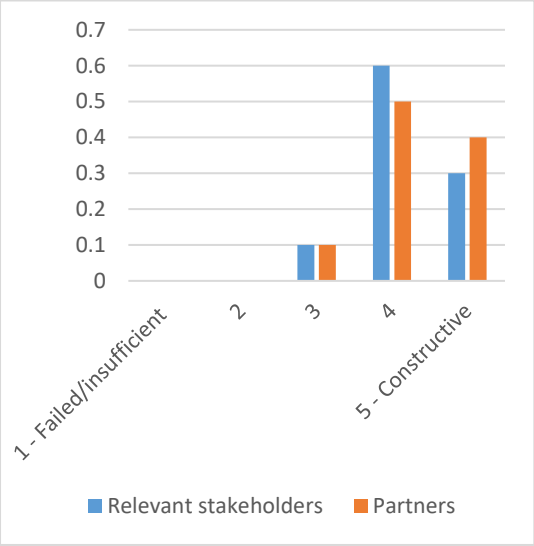
3. In Göteborg, some challenges have been other project plans changing and therefore not always synchronizing with (the planning of) the SCOREwater project. In this case the SCOREwater project is dependent on the infrastructure project of the West-link.

> *"For example some of the places we intended to make measurements in has been changed for different reasons and that has caused a few difficulties in planning the recipient-measurements. It is also hard to find good spots to place the measurement equipment and it often involves people from different departments within the city for permissions etc, and administration connected to that. I think the project leaders at IVL has been very agile and good at solving problems during the implementation phase."*

4.1.1. PARTNERSHIP ARRANGEMENTS

The respondents were also asked about partnership arrangements on a scale from 1 to 5, where 1 would be negative (low/insufficient etc.) and 5 would be a positive (good/constructive). Each respondent assessed both stakeholders (blue staple) and partners (orange staple). Overall, the partnerships are evaluated quite positive, no one has answered below three in any of the evaluations.

The arrangements with partners are perceived as more constructive compared to other relevant stakeholders in the first evaluation (figure 3). This, however, has changed some in this second evaluation. It should be noted that partners in the project, in some cases, also are important stakeholders.



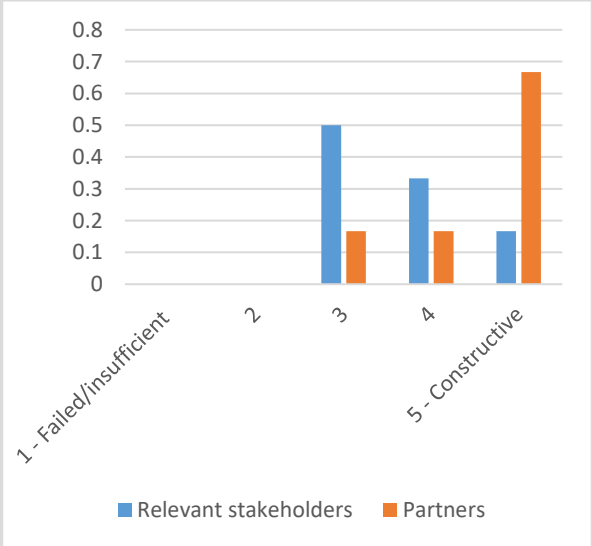


Figure 2: Second evaluation (left). Figure 3: first evaluation (right). How do you perceive that the partnership arrangements are with the following?

The respondents' experiences differ from each other. Some have experienced major problems with partner engagement and some none at all. The partnership arrangement is by a couple of respondents perceived to be helpful for the project advancing. For others, when collaboration not functioning it can be hindering to a whole case as it is interdependencies in many activities.

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Regarding stakeholders, some think they could be even more involved, that the engagement could improve concerning communication and that recurring input from time to time is needed. The involvement is also believed to be more fruitful once more results are coming in and the platform develops.

A way to try to handle the challenges with collaboration and partnership arrangements is through constant dialogue with stakeholders, which one of the respondents also mentioned. Another respondent describes their good partnership arrangements, that all involved actors are highly motived, and something that is helped by regular meetings and dialogue between them, helping to address any challenges arising.

> *"The different partners in the case study are highly complementary, and we work very well together. We maintain continuous periodic meetings. There is a very good atmosphere of work and trust, and we are having fun."*

4.2. TECHNICAL FACTORS

This section is about barriers and/or enablers in the technical work, activities, know how, problem related questions (e.g., collection of data, type of data, data analyse, machine learning, algorithms, platform design etc.)

In order to continue progress in the project and learn from the activities that is working well, enabling aspects needs to be identified. According to the 20 respondents, technical enabling factors have been for example; communication, teamwork, know-how in the teams and problem solving between the partners. Further, one respondent state that the fact that the water treatment is functioning and provides good access for the measuring equipment, and that the collection of data from different sources is working are enabling factors that are important for progress in the project.

When it comes to technical challenges/barriers the answers indicate a change from last evaluation in what the respondents find most challenging (See figure 4 and 5). Despite that the respondents were fewer in the first round, the results indicate that there is a shift in perception of technical challenges; In the first evaluation the complexity of the problems to be solved were more pressing. This time, more project members are experiencing "additional technological requirements you didn't expect" and "specific technology not available or other technical problems". This is probably due to the progress of the project and that we have gone into the implementation phase where aspects with availability and issues with technological requirements are more likely to occur.

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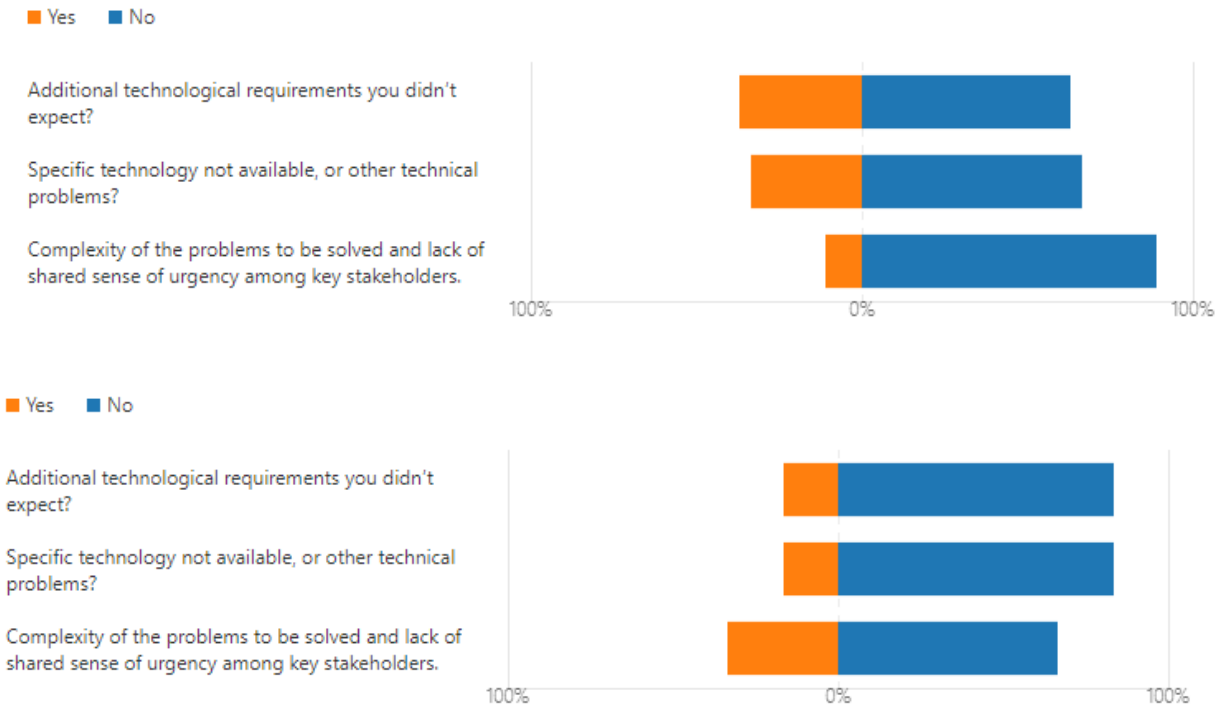

Figure 4: Second evaluation (top), based on 19 answers. Figure 5: First evaluation (bottom), based on six answers. Have any of the following aspects been challenging?

Other challenging aspects stated:

- Bureaucratic issues with purchasing of components and other permits required more work than anticipated
- Availability of data models to harmonize data into
- Some technology components purchased for the project have not worked as well as expected.
- Low data quality or lack of data
- The gap between different disciplines, e.g. computer engineering vs. water engineering

These challenges have mainly been managed through revising plans and the ability to be flexible among partners according to the respondents. When asking for solutions to these challenges, many respondents mentions working together; just trying and testing different solutions together to find ways forward. For example, additional data sets are now being integrated to the data-driven models in order to improve the prediction accuracy. Other issues have been for example issues with wireless communication and developing electronics in sensors to get it to work.

> *"We have purchased additional technology components and replaced as needed to get the function and performance that we need."*

4.3. COMMUNICATION AND COLLABORATION

This section is about barriers and/or enablers regarding communication and collaboration with other partners/stakeholders/end users in the project etc.

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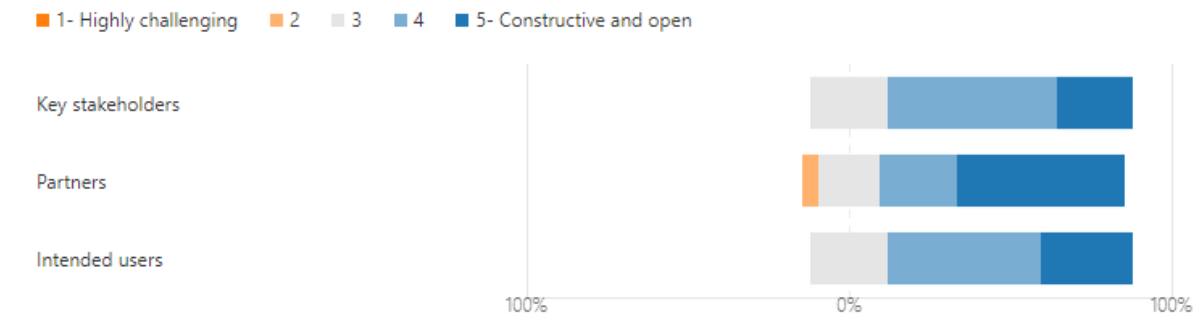
In the first evaluation the respondents thought that consultation and involvement from other partners and stakeholders were relatively constructive and open. But regarding intended users it was a lower result, which can be expected as the project was still in early stages and no implementation had been done yet. The second evaluation shows that the consultation and involvement from intended users are no longer seen as that challenging. However, the involvement of some partners is challenging. Note that the scale definition has been reformulated from “Insufficient” to “Highly challenging”.



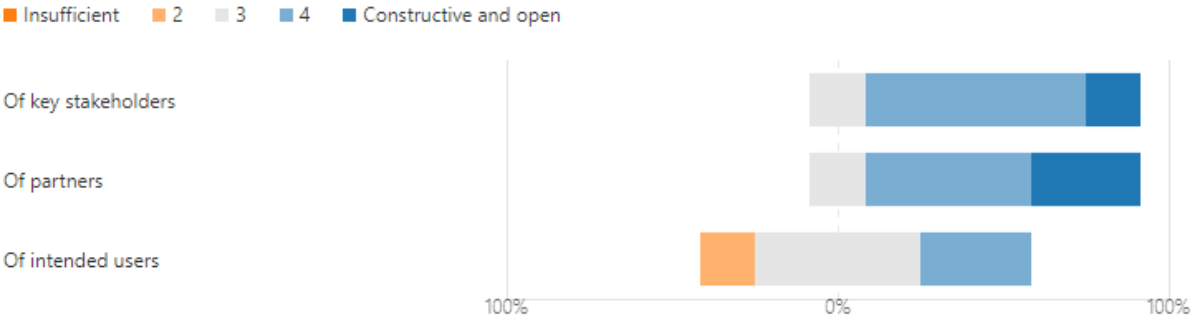


Figure 6: second evaluation (top). Figure 7: first evaluation (bottom) “Consultation and involvement with the following (stakeholders, partners, intended users) have been:”

Challenges regarding communication and involvement described is for example described as how to align various interests of different actors involved.

> *“companies sometimes have an interest to develop services to make money (i.e.: to keep it at least partly closed), whereas the citizen scientists want to open up everything (data, applications etc). Their shared value lies in gaining a better understanding of the environment. By focusing on this as the starting point, we have been able to build on a constructive partnership.”*

Further, the respondents describe slow communication with stakeholders as challenging, when it comes to for example getting approvals for new technology implementation and data collection rules. The digital meeting world we see today is also perceived as challenging to some, the face-to-face meetings we are used to, could have resulted in more actions and more issues handled at the same time. But a way to deal with this is more preparation before meetings, more calls and flexibility of stakeholders.

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4.3.1. INCLUSION OF NEW PERSPECTIVES AND STAKEHOLDERS

Most of the respondents have included perspectives and/or involved new stakeholders in their work (figure 8 and 9). Those who have included stakeholders and end-users have done so because they needed more information about technical components and solutions, to increase their understanding of how the platform could and should be used as well as learn about the stakeholders' needs. Some also state that other stakeholders could be relevant to include further on, for example the county administrative board, civic science organizations and other stakeholders that could help improve impact. A couple of respondents think that the number of existing stakeholders and or end-users is sufficient for the project.

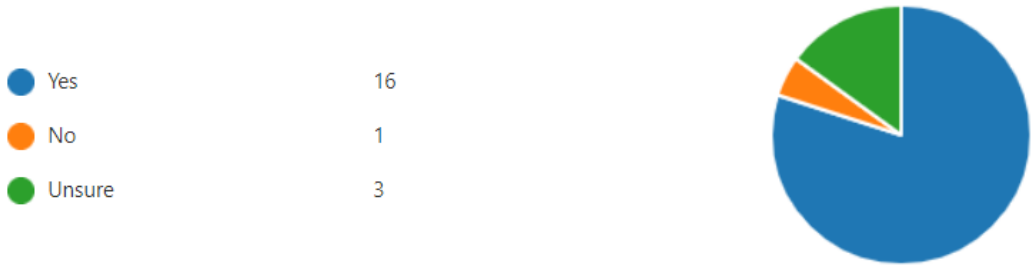

Figure 8: Have you included perspectives from, and/or involved, different stakeholders in your work?

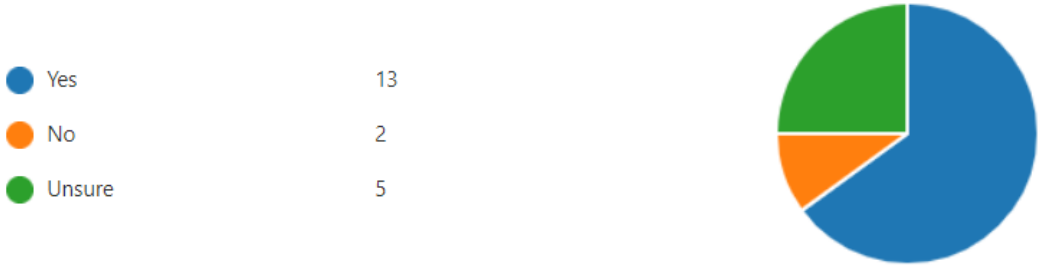

Figure 9: Have you included perspectives from, and/or involved, different end-users in your work?

One third of the respondents said they had included or considered including additional stakeholders (figure 10). Mainly, stakeholders and end-users have been included to provide data, and to be able to see what could be done with their data. They have also been included to provide their perspective and their input on needs, requirements, development etc. A couple of respondents think that it might be needed to include them later on in the project.

Figure 10: Have you considered and/or included new stakeholders in the project during implementation phase?

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> *"We have, in the Project, different understandings on different WPs, deliverables, especially when it comes to partners involved mostly from data platforms and partners involved mostly from the Environment/water stakeholder perspective. We need more sharing of general, simplified knowledge between these two and possible more topics to be able to collaborate effectively. Partly done, by open FIWARE seminars".*

The understanding of what's happening in other case studies/other parts of the project is an area which needs to be improved, no one answering the survey thinks that their understanding is good, and 40 % of the respondents think that their knowledge is limited or fairly limited (see figure 11).

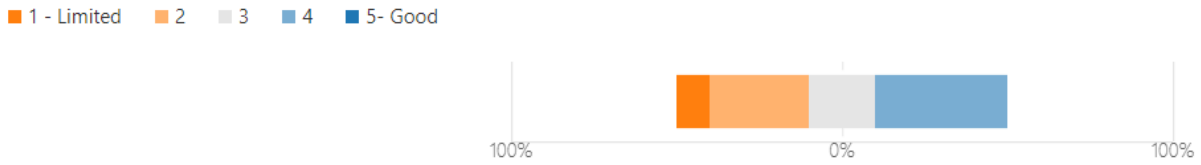

Figure 11: How is your understanding of what's happening in other case studies/other parts of the project that you are not mainly involved in?

We further asked the respondents on how they would like to be updated about activities and other parts of the project that they are not naturally involved in.

Most of the respondents thinks that the existing communication structure is good, with STCs, consortium meetings and different presentations about WPs, cases and activities in these forums. A number of respondents mention digital newsletters, approximately twice per year or when developments happen that should be shared. This could be done through email, web page or LinkedIn. A suggestion from one respondent was more meetings between WPs to be able to highlight issues earlier and share information. Another suggestion was specific meetings where the cases can present what they are doing, preferably concerning technological specifics that could be of help between the case studies. In addition, more updates on what kind of measurements and data acquisition in the other cases. A few also mentioned alternative options of communication, short videos about the cases, images or graphics with descriptions (from which you can read more in the newsletter or similar, if interested).

4.4. CONCLUDING QUESTIONS

4.4.1. ENABLERS

The issues that worked well in this phase of the project (Implementation) are, despite identified barriers and challenges of the same character, mostly regarding communication and cooperation between partners and stakeholders. Discussions, constructive dialogue and truly engaged people are highlighted. Most seem to understand the case clusters to have a constructive collaboration and work together to solve problems and reach the project goals. Other aspects of the project that seem to work well based on given answers in the survey are;

- progress tracking between case studies,
- previews of work in progress,
- implementing technology and placing sensors despite challenges.

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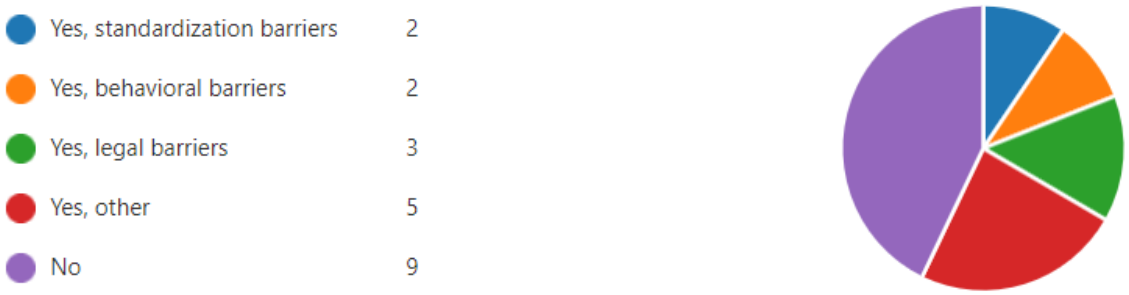
Further, one example that is lifted as successful is the workshops with stakeholders using the Value Proposition Canvas in one of the demonstration cases, as it proved important to have two to three meetings with each stakeholder to understand the real needs.

4.4.2. BARRIERS AND ROOM FOR IMPROVEMENT

Despite that almost 50 % of the respondents haven't identified any more barriers as mentioned already (see figure 12), there are still a few challenges in the process. For example, legal barriers when installing sensors in the ground to measure soil moisture, technical barriers when accessing data because the data owners have to approve the use, and ethical issues related to personal information when carrying out surveys.



"For a successful implementation of new technology in the city it is important to involve in-field experts and the real end-users through the entire chain of the project. There are some organisational problems in how the City of Gothenburg is organised today where people working on a strategical level in these innovation projects are dependent on other persons for the in-field end-user knowledge that is necessary for a successful project. (For example, people working in field with the sewer- and stormwater system). These in-field experts seldom have time to work in innovation projects and still they are the key-people to bring in very important knowledge and experience as enablers to implement new technology. Theory and practice need a better platform to meet and exchange experience in these issues. I think we have to implement a more integrated way to work with this in the city to use the competence necessary better. That would truly facilitate the implementation of new technology and digitalisation of the water sector."

Figure 12: Have you identified any other barriers in your work so far?

As stated earlier, the respondents think that to ease future activities in the project, there is room for improvement regarding communication between cases and between WPs. Some respondents wish for more exchange between the three cases through for example workshops on topics like e.g. how different cities work, what sensors they use and what the data tells are wished for. Some respondents also see the need for increased engagement from some partners/stakeholders in order to reach the goals for the cases within the planned time. Many partners depend on each other's engagement and that activities are carried out in time for others to be able to start. The division of effort in some activities also needs to improve. A number of respondents note that even more planning is needed. One answer to the question is:

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4.4.3. LESSONS LEARNED

The most important lesson learned according to the respondent is the complexity of the project. It requires a lot of time, planning and trying back and forth to make it work. The number of partners is a challenge regarding communication and cooperation, and it is necessary to revise and update plans on a recurring basis. It is easy to believe that people understand each other but that is not always the case.

Implementation in 'the real world' is difficult, in building sites for example, things are constantly in motion which requires a lot of adaptation regarding sensor deployment. Deployment is also complex because there are several different aspects which need to be taken into consideration, costs, reliability etc. One respondent describes that the technical ready solutions available on the market did not perform as well as marketed, which then required more time than expected to get a good solution installed. The complexity of maintaining water sensor infrastructure in order to ensure high quality data is also lifted. More examples of lessons learned from respondents:

- *"The most important lesson learned is that digitalisation of the water sector is more complex than I thought and that organisational issues is a big part of the complexity. We have to work in a more integrated way in the city which is a quite tricky thing in such a big organization."*
- *"There are many challenges in the water cycle that SCOREWATER can address. Wastewater analysis can help to better manage our society at the social, environmental and economic levels."*
- *"From participating partner perspective, our early adaption to the project would be preferable equivalent to current situation: running behind and trying to catch up. An internally clear objective, a specified targeted end-user and relevant resources for the specified product development and deliverables should have been formulated at the project start. In that way our contribution, both to SCOREwater and our internal business plan would have been greater."*
- *"That it is difficult to find the right commercial driving forces for management of data in the water sector. The question is who shall pay for maintaining the data structures and who has incitements to take the costs."*
- *"There are no bad questions or good questions. Do not hesitate to ask questions."*
- *"In this consortium, with so different backgrounds, it is important that we arrive to a common language and that we take advantage of shared knowledge and experience."*
- *"Great ideas in great projects attract easily good people and societal interest."*

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ANNEX 1: QUESTIONNAIRE

Question	Type of answer
What's your name and organization? (will not be shown in result)	Open answer
Which WP are you mainly involved in?	Open answer
Which demonstration case are you mainly involved in? (if all 3 write "all")	Open answer
Organization and planning *This section is about barriers and/or enablers in aspects regarding the organization of the project, among partners and stakeholders as well as planning of project and activities within the project.*	
Have you experienced organizational or planning aspects as hindering in the implementation phase?	Yes/No/Don't know
Please describe the challenges and how you managed those:	
How do you perceive that the partnership arrangements are with the following? • Relevant key stakeholders • Partners	1-Failed /insufficient 2 - 3- 4- 5- Constructive
Please comment your answer. For example, what challenges with regard to partnership engagement have you encountered and how have you managed those	
Please comment your answer:	Open answer
Technical *This section is about barriers and/or enablers in the technical work, activities, know how, problem related questions (e.g., collection of data, type of data, data analyse, machine learning, algorithms, platform design etc.)*	
What have worked well during the implementation phase (regarding technical work)?	Open answer
Have any of the following aspects been challenging: • Additional technological requirements you didn't expect? • Specific technology not available, or other technical problems? • Complexity of the problems to be solved and lack of shared sense of urgency among key stakeholders.	Yes/No

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Question	Type of answer
Other challenging aspects, please specify	Open answer
If answering yes on question 9-10, please describe how and how you managed it?	
Collaboration/communication *This section is about barriers and/or enablers regarding communication and collaboration with other partners/stakeholders/end users in the project etc.*	
Consultation and involvement with the following have been: • Key stakeholders • Partners • Intended users	1- Highly challenging 2- 3- 4- 5- Constructive and open
Please comment on potential challenges you met and how you managed those:	Open answer
Have you included perspectives from, and/or involved, different stakeholders in your work? (please describe why)	Yes/No/Unsure
Have you included perspectives from, and/or involved, different end-users in your work? (please describe why)	Yes/No/Unsure
Have you considered and/or included new stakeholders in the project during implementation phase?	Yes/no/Not relevant
Please comment on how you included different stakeholders/end-users and what you gained from that:	Open answer
How is your understanding of what's happening in other case studies/other parts of the project that you are not mainly involved in?	1-Limited 2 - 3 - 4 - 5 - Good
Please describe how you would like to be updated about activities and other parts in the project?	Open answer

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Question	Type of answer
Concluding questions	
Have you identified any other barriers in your work so far? (Behavioural barriers may be related to the introduction of new technologies: financial costs, learning costs, prestige, bias toward established technologies and routines, etc.)	• Yes, standardization barriers • Yes, behavioural barriers • Yes, legal barriers • Yes, other • No
If yes, please explain the issues/problems, how it affected you and how you managed it:	Open answer
Please give an example of what have been working well in the project (in implementation phase):	Open answer
Please give an example of something that can be improved (to next phase):	Open answer
What is the most important lesson learned so far in the project SCOREwater?	Open answer

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ANNEX 2 – STOCKTAKING

A final Annex of stocktaking was included in all Deliverables of SCOREwater produced after the first half-year of the project. It provides an easy follow-up of how the work leading up to the Deliverable has addressed and contributed to four important project aspects:

1. Strategic Objectives
2. Project KPI
3. Ethical aspects
4. Risk management

STRATEGIC OBJECTIVES

Table 1 lists those strategic objectives of SCOREwater that are relevant for this Deliverable and gives a brief explanation on the specific contribution of this Deliverable.

Table 1. Stocktaking on Deliverable's contribution to reaching the SCOREwater strategic objectives.

Project goal	Contribution by this Deliverable
SO5	This deliverable is one part of improving conditions for coming work, enable progress and to support the development by aiming towards sharing and bring forward experiences in order to reach improvement in implementing and illustrating the SCOREwater platform. It is therefore contributing to SO5 to identify and mitigate barriers for implementation.

PROJECT KPI

Table 2 lists the project KPI:s that are relevant for this Deliverable and gives a brief explanation on the specific contribution of this Deliverable.

Table 2. Stocktaking on Deliverable's contribution to SCOREwater project KPI's.

Project KPI	Contribution by this deliverable
10	Standardization barriers identified and mitigation options demonstrated: • 2 respondents answers yes there is standardization barriers, e.g Lack of data models.
11	Behavioural barriers identified and mitigation options demonstrated • 2 respondents answers yes there is behavioural barriers, see for example quote page 18
12	Technological barriers identified and mitigation options demonstrated • additional technological requirements that wasn't expected and specific technology not available (or other technical problems). See also section 4.2
13	Organizational barriers and enablers identified and mitigation options demonstrated

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Project KPI	Contribution by this deliverable
	• 8 respondents answers they have experienced organizational or planning aspects challenging in the project. The complexity of the project requires often frequent revised planning. Enablers to overcome this challenge is for example dialogue and regular meetings. Many finds the Covid-19 pandemic as a significant cause to these challenges.

Note from author: Barriers are sometimes identified but no concrete mitigation option demonstrated

ETHICAL ASPECTS

Table 3 lists the project's Ethical aspects and gives a brief explanation on the specific treatment in the work leading up to this Deliverable. Ethical aspects are not relevant for all Deliverables. Table 3 indicates "N/A" for aspects that are irrelevant for this Deliverable.

Table 3. Stocktaking on Deliverable's treatment of Ethical aspects.

Ethical aspect	Treatment in the work on this Deliverable
Justification of ethics data used in project	Not relevant
Procedures and criteria for identifying research participants	Not relevant
Informed consent procedures	Not relevant
Informed consent procedure in case of legal guardians	Not relevant
Filing of ethics committee's opinions/approval	Not relevant
Technical and organizational measures taken to safeguard data subjects' rights and freedoms	Not relevant
Implemented security measures to prevent unauthorized access to ethics data	No personal information has been handled
Describe anonymization techniques	The survey was sent out to all partners but no information is given about who have responded and what they single individuals have answered.
Interaction with the SCOREwater Ethics Advisor	None, not relevant

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RISK MANAGEMENT

Table 4 lists the risks, from the project's risk log, that have been identified as relevant for the work on this Deliverable and gives a brief explanation on the specific treatment in the work leading up to this Deliverable.

Table 4. Stocktaking on Deliverable's treatment of Risks.

Associated risk	Treatment in the work on this Deliverable
	No risk from the risk log identified

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