SCOREwater

Smart City Observatories implement REsilient Water Management

DELIVERABLE D8.3
RISK MANAGEMENT PLAN

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ABBREVIATIONS

Abbreviation	Definition
CoP	Community of Practice
ICT	Information and Communications Technology
IoT	Internet of Things
PMT	Project Management Team
PSB	Project Steering Board
SDG	Sustainable Development Goals
SME	Small and Medium-sized Enterprises
STC	Scientific and Technical Committee
WP	Work Package

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.

SUMMARY

This deliverable is an outcome of activities performed by the Project Management Team (PMT) at IVL under task 8.5 Risk Management. It provides guidelines to the SCOREwater partners on risk management process and risk assessment procedure.

Risk assessment is integrated in the monthly meetings of the Scientific and Technical Committee (STC) which consists of the co-ordinator and all WP leaders. Risk assessment is also performed with representatives from the whole SCOREwater consortium in the biannual meetings of the Project Steering Board (PSB). Each partner also has the responsibility to report immediately any risk that arises and may affect the project objectives or their successful completion.

The risk log of September 2019 is included in Annex 1. Annex 2 shows the template of the monthly WP update reports to STC. The risk log and the WP update report template are accessible to the project partners via the SCOREwater Sharepoint.

1. RISK LOG

In order to create consortium awareness, monitor, mitigate and minimize the impact of the project risks, a risk log has been set up and made available to all project partners as a read-only file on the SCOREwater Sharepoint. The risk log is maintained and updated by IVL as part of the Risk Management Process. It includes the identified risks, a risk assessment and proposed mitigation measures. The risk log per September 2019 is included in Annex 1.

1.1. RISK ASSESSMENT

The risk log includes a scoring of each risk based on assessment of the **Probability** of the risk occurring and the **Impact** on the project if it does. Probability and Impact are individually assessed by a qualitative assessment in three levels L/M/H for Low/Medium/High, also represented by the values 1/2/3 for calculation purposes. The score of the risk is calculated as the product of Probability and Impact. The resulting score is coloured as either Green (a score of 1-2), Amber (a score of 3-4) or Red (a score of 6 or 9) to give a visual aid in classifying the significance of the risk, see Table 1. The significance indicates the urgency of putting mitigation measures into force <u>if</u> the risk occurs. For critical risks and long-term risks, that could occur beyond the project lifetime, mitigation measures may need to be taken even if the risk has not occurred.

- Green – No immediate reaction required

- Amber – Action may be required soon and responsible WP leader should be prepared

- Red

    o If the risk has occurred: Immediate reaction required. WP lead to inform STC and coordinator.

    o If the risk has not occurred including long-term risks: Need for careful monitoring of the risk. Mitigation measures are put into force on a case by case basis.

Table 1. Risk assessment scoring

Probability	Impact	Score
L	L	1
L	M	2
M	L	2
L	H	3
H	L	3
M	M	4
M	H	6
H	M	6
H	H	9

1.2. MITIGATION MEASURES

A mitigation measure is developed for each identified risk as part of the risk management process. The measures can describe both preventive actions to keep the risk from not occurring and actions that need to be taken in case the risk does occur. Extra attention is put on the development of mitigation measures for the most significant risks. The mitigation measures are saved in the risk log.

2. RISK MANAGEMENT PROCESS

The risk management process identifies and monitors internal and external risks that may affect the project progress towards its objectives. Suitable mitigation measures are developed for each risk in order to carry out mitigation actions as early as possible. Risks can arise from unexpected technical difficulties or unexpected scientific findings, poor communication or co-operation between the partners, resource shortage by the partners, human operational errors, planning errors, poor quality, incomplete tasks, etc.

SCOREwater applies the following process for identification of risks and their mitigation:

- The risk log is reviewed regularly, and updated if necessary, in
    - the monthly WP update reports (review log) and the corresponding STC meeting (update log). The template of the WP update report is included in Annex 2.
    - the regular PSB meetings that occurs during SCOREwater Consortium meetings twice per year (review and update log).

- Each partner also has the responsibility to report immediately to their respective WP Leader and to the Project Coordinator any risk that arises and may affect the project objectives or their successful completion. The WP leader and Project Coordinator then consults the risk log for previous documentation of similar risks and puts the corresponding mitigation measure into force if applicable. If necessary, the risk log is updated with a new risk and a suitable mitigation measure is elaborated.

- Any change in the time schedule of deliverables or in the allocated budget must be reported to the corresponding WP Leader. In case of problems or delays, the WP leader raises the issue to the STC for consultation and the STC may establish task forces to take the necessary actions according to the directions provided by the PSB.

- In case no resolution is reached, the PSB will be consulted and will establish mitigation plans to reduce the impact of the risk occurring. Responses may include increased supervision, adjustments to the project strategy, changes to implementation arrangements, and/or changes in budget allocations.

3. RISK MANAGEMENT STRATEGIES

The primary strategy of risk management is to avoid the risk entirely, if possible, without requiring unreasonable actions or measures.

The secondary strategy, if a risk cannot be avoided, is to take actions to try to reduce the risk by making it either less likely or less consequential. In this case, mitigation measures need to be developed and agreed by the WP leader (and other affected partners) and the STC.

If mitigating, controlling or avoiding a risk is not possible because the time and cost involved is too high to justify the benefits, the risk must be accepted. STC will monitor any changes in Probability and Impact of those risks at their regular meetings.

ANNEX 1 – RISK LOG, SEPTEMBER 2019

The up to date content of the risk log includes risks identified at the time of project proposal preparation and updates after risk assessment in the PSB at the kick-off meeting (Göteborg 2019-05-17). The monthly STC meetings have this far not brought up any additional risks.

Table 2. Risk log per October 2019

Risk number	Description of risk	Proba bility	Impact	Score	WP	Proposed risk-mitigation measures
1	Project execution failure, technical problems and delays (key milestones or deliverables delayed)	M	H	6	WP1, WP2, WP3, WP4, WP5, WP6, WP7	In WP8 daily project monitoring, implemented tight working relationships and quality control (STC), milestones and deliverables with critical paths have been introduced, including ethics. In the event of technical problems and time delays, we will produce a priority list working with the Project Officer (PO) and the affected project partners to adjust the project to achievable timescales and objectives.
2	Low commitment of the partners to the project plan and deadlines	L	M	2	WP1, WP2, WP3, WP4, WP5, WP6, WP7	All partners of the consortium are familiar with this type of project activities. Clear responsibilities are allocated for every task in the WPs. In cases needed, WP leaders directly address partners' lack of commitment. If unsuccessful, the STC will contact the relevant partner and, if necessary, re-allocate tasks and resources.
3	Shortage of financial or personnel resources	L	M	2	WP1, WP2, WP3, WP4, WP5, WP6, WP7	Make the availability of resources in the partners a legally binding commitment, as part of the CA. Make the delivery plan part of the CA and only release payment to partners on delivery. Re-allocation of resources between partners to increase efficiency will be performed if necessary.
4	Loss of key staff	M	L	2	WP1, WP2, WP3, WP4, WP5, WP6, WP7	There is no critical task that is dependent on a specific individual. It will be policy to spread knowledge throughout the team. Most of the partners are large organisations and will be able to replace staff as needed. If necessary tasks will be re-assigned by the STC
5	Loss of key partner	L	H	3	WP1, WP2, WP3, WP4, WP5, WP6, WP7	Effective management procedures to timely intercept problems, and/or reallocate partners. The CA will govern the policies behind. If needed, replace with new partners with suitable skills and profiles in collaboration with the PO.

Risk number	Description of risk	Proba bility	Impact	Score	WP	Proposed risk-mitigation measures
6	Communicate effectively in the consortium	L	L	1	WP1, WP2, WP3, WP4, WP5, WP6, WP7	PMT will timely intercept the problem and discuss it individually with concerned partners. Find online and face-to-face communication methods that all partners can use. Increase the number and frequency of meetings (e.g. have weekly targeted teleconferences).
7	Unacceptable quality of results	L	M	2	WP1, WP2, WP3, WP4, WP5, WP6, WP7	The reviewing process for all project deliverables and reports, plus the contribution of the PAB, will ensure the acceptability of project results. The STC (with the Quality Assurance Officer) will decide on corrective measures to be taken to improve the quality of results, and if necessary, to re-allocate this responsibility to another partner.
8	Lack of consensus on scientific, technological approach or business model approach	M	H	6	WP1, WP2, WP3, WP4, WP5, WP6	The responsible partner for the deliverables will at an early stage communicate an overview of the deliverable so that any disagreements are identified early. Diverse and highly expert PAB members will be selected early on, to act as advisors. Discuss and agree on a common standing in the STC, and seek input from the PAB, as external advisors. If necessary other specific experts will be sought and added to the PAB. The project has an innovation management function in WP8 to address this risk.
9	The solutions developed are too case specific	L	M	2	WP1, WP3, WP6	The variety of end users, country and domain wise (WP4), and actors from the whole value-chain (WP4), will ensure a wide view and adoption of the proposed innovations. SCOREwater will take into account, and connect to, existing EU and International generated knowledge and initiatives (WP6).
10	Data from Cases are sparse and are not enough to apply all methods and tools	L	M	2	WP1, WP2, WP3	WP3 is designed to allow different tools to be applied to different cases. The toolbox is flexible to work with as much data as available and key cases where we know a lot of data exist are identified to demonstrate the tools. If a case has less data than we need to provide even basic assessments, we will target data collection there, in collaboration with the WPs leaders and if needed shift resources in WP3 and WP8 (project management) to solve the problem.

Risk number	Description of risk	Proba bility	Impact	Score	WP	Proposed risk-mitigation measures
11	Failure on installing sensors on demo-sites	L	M	2	WP4	The demo-site information and sensors specification are reviewed deeply in WP1 to ensure proper installation. If needed, shift resources within the project to solve the problem.
12	Outputs generated by the smart algorithms not as useful as expected	M	M	4	WP2	Perform continuous iteration and validation of the smart algorithms by using validation techniques. Close supervision of the algorithms and testing. Validation of the outputs with the experts to safety test and approve the tool. Integrate new datasources in order to improve the accuracy.
13	Failure architecture implementation and modules integration	M	M	4	WP3	Validation of the architecture by specific testcases and relevant stakeholders. Iterative integration of the modules during the development. Re-evaluation of the platform architecture and leveraging viability of component and tools against integration feasibility in cases where initial issues have been identified. Creation of a pre-production environment. Connect to other platform experts such as the FIWARE foundation and TM Forum as well as experts and experiences from other EU projects
14	There is less interest than anticipated in the uptake of the SCOREwater services	M	M	4	WP4, WP5, WP6, WP7	The digital services are developed from the requirements of end-users. As part of WP6 and WP7 we will target relevant audiences and proactively demonstrate the digital services – and modify based on feedback if needed to enhance uptake. In WP5 the social enablers will be identified to identify the obstacles of uptake and overcome them. The project also has an innovation management function in WP8 to address this risk and ensure that the project goes from innovation to market.
15	Stakeholders outside the project are not interested	M	L	2	WP1, WP2, WP3, WP4, WP5, WP6	Stakeholders will be contacted early in the project to participate in CoPs (WP4). Various communication activities to raise interest are foreseen in WP7. The PAB consists of internationally renowned leaders in the area, who will act as ambassadors. Communication tailored to target audience to gain (renewed) interest, working bottom up with key audience members (e.g. engage our government partners as links to local authorities outside SCOREwater, leveraging e.g. Global City networks such as the 100 Resilient Cities).

Risk number	Description of risk	Proba bility	Impact	Score	WP	Proposed risk-mitigation measures
16	Low interest from local stakeholder to participate in demonstration cases.	H	M	6	WP3	The design of the demonstration cases starts with an inquiry of important stakeholders, most of them already involved in the local clusters. The agenda and goals of the CoP meetings can be altered to increase the benefit for all stakeholders, including those who lost interest.
17	Market demand for the project outcomes is lower than expected and/or take longer than expected to grow.	M	M	4	WP5	We will specifically initiate market uptake activities and target reasons for delay or barriers to implementation in several WPs (e.g. WP5) to identify specific ways forward to the market (see WP6 description). Reasons for low interest in specific innovations will be analysed in the cases (WP4) and assessed in terms of legacy, organizational barriers (WP5) and business perceptions (WP6). We will focus more on those solutions that are taking off much faster than the others. The project also has an innovation management function in WP8 to address this risk and ensure that the project goes from innovation to market.
18	Dissemination activities raise little interest in the project	L	M	2	WP6	The communication plan will be updated (section 2) according to the project. In case of low interest in the project, additional, targeted communication channels will be used.
19	Tasks are dependent on activities beyond the project	L	L	1	WP4	There can be delays or cancelled activities that the project is dependent on, such as the West Link or the Amersfoort biking lot. Reserve plans are in place, to be used in such circumstances
20	Lack of mature standards and data models might influence the uptake of services, replicability and scalability.	M	M	4	WP1, WP2, WP3	The development of Open Urban Platforms, IoT-standards for smart cities and related standards is in its early stages. We collaborate with FIWARE and TM Forum who work on standardization of data models for cities. A front runner program has been started to coordinate these initiatives, resulting in harmonized models in the coming years.

ANNEX 2 – WP UPDATE REPORT TEMPLATE

The following template is used by WP leaders to report on WP progress and raise critical issues in the monthly STC meetings. It is saved in the Templates folder on the SCOREwater Sharepoint.

WP<X> UPDATE, DDMMYYYY

The purpose of the update report is for WP-leaders to provide a short update on the status of their WP. It will be circulated to the STC in front of the monthly meetings. A RAG (Red, Amber, Green) status icon is applied in order to easily highlight topics in need of attention by the STC and PMT.

WP STATUS

	Result	Schedule	Cost	Resources	Risks
WP<x>	🟢	🟢	🟢	🟢	🟢

Brief explanation, especially in case of Red or Amber icons.

Result	
Schedule	
Cost	
Resources	
Risks	

UPDATE ON WP PROGRESS SINCE LAST REPORT

Short summary on last month's progress in your WP.

WHAT COMES NEXT?

Short information on plans for next two months. Especially things that require cooperation among partners and cross WPs should be highlighted here.

GUIDELINES

OVERALL INTERPRETATION OF ICON COLOUR

🟢 Nothing to worry about. Work proceeding according to plan.

🟠 Clouds on the horizon. There are issues that need to be discussed in STC.

🔴 There is a problem that needs immediate attention by STC/PMT!

CONTEXT OF EACH TOPIC

Result

Are the Deliverables that have been submitted in the EU-portal accepted by EU?

Schedule

Can we finalize our tasks and the associated Deliverables according to time plan?

Cost

Can we finalize our tasks and the associated Deliverables within the budget?

Resources

Do we have the necessary resources to finalize our tasks and the associated Deliverables? Resources in terms of the right people and the right equipment.

Risks

Set icon colour after reviewing the Risk log for risks linked to your WP. Does an identified risk need attention? Is there a need to add any additional risks to the log?

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