MID-TERM EVALUATION CONSENSUS REPORT

Mind the Water Cycle Gap: Innovating Water Management Optimisation Practice (IN-WOP)

Name of Coordinator: Dr. Jan Kwakkel
Project code: WaterWorks2017- IN-WOP
Duration of project: 36 M
Start date: 01/07/2019 End date: 30/06/2022

FOLLOW-UP GROUP

Please include the data of the FG members reviewing the report

Name	Organisation
Antonio LO PORTO	Istituto di Ricerca Sulle Acque IRSA-CNR (Water Research Institute
Gaëtane SUZENET	International Impact Partners

1. Scientific and technological progress (Maximum *250 words)*

Please describe the work performed and the results obtained during the lifetime of the project, and the conformity of work progress within the initial schedule. Take into account the following aspects:

- *Has progress been achieved towards reaching the project objectives according to the original description and milestones?*
- *Detailed update on methodology & results*
- *How has the progress of the project promoted a multi-disciplinary work?*
- *Dissemination of the results (publications, patents, other)*

The project aims at exploring the convenience of adopting "many-objective" optimization approach in IWRM as compared to the classical "multi-objective" one, in order to avoid the bias deriving from ethical concerns related t the inclusion of undesirable or hidden trade-off.
The project plans to test and demonstrate such new approach in three case studies, around which are centered the main operational WPs.
The COVID-19 pandemic has caused substantial delays in the implementation of field activities and meetings within partners and with stakeholders, so that very few results have been exposed. The major part of the work carried out so far can be considered propaedeutic to the core part that is still to be undertaken.
Because of the delays due to the pandemic and to an unbelievable series of unfortunate issues with research contracts with young researchers the consortium has not yet finalized any of the expected deadlines. None of the milestones have been achieved yet.
WP1: The project partners have been developing an ethically-informed many-objective framework for water resources management. They focused on reviewing both ethical issues in each of the 3 case studies and the potential role and operationalization of distributive justice. The mid-term report does however not mention how the other criteria indicated in the main proposal will be considered.
Findings were different in each case study and were used for designing the framework that will

focus on inter-generational and distributive justice and tested in the 3 areas. A position paper will be issued.
Because of COVID 19, the partners decided to develop a 'stylized case study' that would entail the main characteristics of the 3 case studies and serve as an example of how the framework can be applied. A cross comparison model has also been developed.
WPs2, 3, 4: Each WP entails similar tasks to be undertaken. The level of achievement for each is however different. Whilst progress has been made for the Lake Como study area, concerning the stakeholders identification, model operationalization and the integration of the many–objective approach, work for the Seine River and The Meguellil Basin has been less advanced because of constraints linked to COVID 19 and staffing issues.
The multi-disciplinary approach has been limited due to the lack of interactions with other stakeholders.
Publications are forthcoming, as well as participations in conferences.

2. Collaboration, coordination and mobility within the Consortium (Maximum *250 words)*

Please evaluate the collaboration, coordination and mobility within the Consortium
Take into account the following aspects:

- *Efficiency on the coordination and organization of the projects*
- *Collaboration effective between the partners*
- *Mobility of the research between the consortia*
- *Does the project meet the transnational nature and its added value?*

Notwithstanding the perturbation given by the COVID pandemic, the consortium has been able to have a considerable number of on-line meetings. The collaborative and mobility aspects were limited because of the constraints linked to the COVID 19 situation. Nonetheless, the bilateral collaborations and interactions between the project partners, through online exchanges, have been effective (one example of interactions is the development of the stylized case study, which involves the 4 partners from Italy, Tunisia, the Netherlands and France, with the Politecnico di Milano, guiding INAT and the French partners in the model operationalization).
The adopted strategy of having different WP for each case study is rather questionable and definitely intrinsically not helping in fostering collaboration between partners. The added value of the transnational aspect mainly lies in the possibility to use the case studies as potential bases for identifying the necessary key elements that will both mainstream many objectives optimization approaches in water resources management and align different stakeholders' interest and preferences. This is however still being to be demonstrated.

3. Coordination with other international project funded by WaterWorks2017, or other instruments (Maximum 250 *words)*

Please evaluate the external collaboration of the Consortium
Take into account the following aspects:

- *Collaboration effective with other projects funded under the 2018 Joint Call:*
- *Collaboration effective with other projects or consortia.*

The project consortium mainly interacts with another WaterWorks2017 project, i.e. SIMTWIST. In particular TU Delft and Wageningen University and Research interact to explore how the

knowledge built on modelling with stakeholders by TU Delft could benefit SIMTWIST. Politecnico di Milano built on their participation in the H2020 DAFNE project to particularly explore the value of including ethics and equity issues in water resources management and infrastructure planning.

4. Coverage of the themes and sub-themes of the call (Maximum 250 words)

Please evaluate relation within the project results and the themes and the sub-themes of the call.

Theme 1. Enabling sustainable management of water resources.

The overall aim for this theme is to develop new governance and knowledge management approaches.

- Sub-theme 1.1. Promoting adaptive water management for global change:
  The aim of sub-theme 1.1 is to increase knowledge and to develop evidence-based methodologies and technologies for monitoring the cumulative impacts of human activities and climate change on the water cycle, but also to develop management options on the water cycle (considering all cycle compartments) and water / ecosystem services. This knowledge must be applicable for the adaptive management of water resources on a regional scale, while enabling downscaling to address local or catchment situations.
- Sub-theme 1.2. Integrative management by implementing Natural Water Retention Measures (NWRM) such as Managed Aquifer Recharge (MAR):
  The aim is to increase the knowledge and develop NWRMs such as MAR in a multidisciplinary way, to protect, prolong, sustain and augment freshwater supplies. Evidence of their effectiveness and on the multiple benefits they deliver should be demonstrated.
- Sub-theme 1.3. Mitigating water stress in coastal zones and urbanized areas:
  The aim is to develop and demonstrate a comprehensive coastal zone management system based on monitoring and modelling to ensure the provision of freshwater security under a range of conditions including saline intrusion, sediment management, storms, floods and droughts, but also specific coastal water uses. Please, refer to H2020 calls on nature-based solutions to propose complementary actions.

Theme 2. Strengthening socio-economic approaches to water management.

The overall aim of this theme is envisaging education and communication initiatives to raise social awareness of consumption habits and water scarcity and to increase the levels of social acceptance and use of recycled water.

- Sub-theme 2.1. Integrating economic and social analyses into decision-making processes:
  The aim is to increase the knowledge the effectiveness and efficiency of existing economic mechanisms and policy instruments related to water management, with a special emphasis on implementation of water policies (such as the EU Water Framework Directive) and development of a circular and green economy. The approach should aim to break boundaries between services valuation including more flexible pricing and charging mechanisms, management tools and institutions, and the employment of economic and social sciences to develop best practice management guidelines for efficient water uses, including under extreme events such as droughts and floods.
- Sub-theme 2.2. The reuse of water:
  The aim is to develop integrative methods and cost-effective technologies for the implementation of acceptable and sustainable solutions on a large scale for different reuse cycles, spanning from irrigation, via livestock drinking water, to human consumption. Furthermore, goals include assessments of social acceptance for the use of recycled water and the development of integrated approaches combining technological solutions with social-psychological acceptability, economic viability and appropriate governance approaches. Research into the removal of emerging contaminants must consider the cost of the technology vs yield and realistic options for reuse of the recovered water. Please refer to projects funded under previous Water JPI Joint Calls (2013, 2015 and 2016) to avoid any duplication. See Joint Calls on Water JPI website.
- Sub-theme 2.3. Connecting science to society:
  The aim is to increase understanding of the role of socio-economic approaches to water uses in hydrological cycles. Knowledge building should address stakeholders' and public awareness of water challenges and values, and how perception of policy measures and technological solutions are formed and how stakeholders can be steered towards desirable behaviour. Local and/or regional context (attitude, social norms, cultural context, etc.) should be taken into consideration. The value of improved water stewardship overall should be considered by developing sustainable business models.
- Sub-theme 2.4. Promoting new governance and knowledge management approaches:
  The aim is to develop innovative water management tools and approaches suitable for decision-making based on an analysis of the limitations of current practices. These approaches should involve the broad participation of stakeholders (including public monitoring, communication and education), multidisciplinary research, and short and long-term water cycle scenarios to support decision-making and the integration of water policy into other policy fields. In effect, governance capacities for implementation of water policies at the local and regional levels should be enhanced.

Theme 3. Supporting tools for sustainable integrative management of water resources.

This theme aims to complement the actions developed under the European Strategy Forum for Research Infrastructures (ESFRI) and other European initiatives. Emphasis should be on establishing networks and information sharing among existing research facilities/field labs, analytical methods, monitoring tools and programmes, access to databases and platforms, exploring the use of big data solutions and establishing reliable hydrological standards. Across the globe, there is a large body of knowledge,

methodology and data related to hydrology and the water cycle that has the potential of being beneficial for a wide range of the world's regions. The alignment of water-related research and sharing of data and results will serve to avoid duplication of research, support progress based on previous finding, and thus facilitate the establishment of water management policies addressing rapid climatic changes.

The IN-WOP project relates to Theme 1. 'Enabling sustainable management of water resources' and particularly sub-theme 1.1 'Promoting adaptive water management for global change', and to Theme 2 Strengthening socio-economic approaches to water management and in particular to sub-theme 2.4 'Promoting new governance and knowledge management approaches'.

However the assessment about the degree of the contribution of the project to those subthemes is not possible in this stage because of the very limited quantity of work done due to the COVID pandemic.

5. Stakeholder/industry engagement *(Maximum 250 words)*

Please evaluate the participation of stakeholders/industry on the project and the added value of this participation.

Stakeholder involvement has been actually prevented by the pandemic. Most of the contacts started so far have been conducted via online meetings. The consortium however has clear ideas about which stakeholder to involve and for what purpose.
In the Lake Como, the main stakeholders have been identified and discussions on indicators to be included in the framework have been on going. Interactions with the regional and local stakeholders were also successful.
The French partners were able to meet only with the Hydrology Director of EPTB Seine Grands Lacs to support the case study building.
In the Meguellil river basin, stakeholders have been identified. They have been providing data to refine the System Dynamics Model that has already been developed for the Kairouan region.
No industry engagement is planned in the project.

6. Recommendations for improvements/amendments of the report (Please complete Table below)

Page	Modification	Rationale for change

7. General Assessment Comments *(Maximum 250 words)*

Please include a summary of the key points of this evaluation.
Problems identified or specific risks to the projects. As well recommendations/feedback, which could be relevant to the Consortium.

The main problem identified is related to the COVID 19 situation, which has hampered to fully implement the stakeholders' involvement process, and limited the collaboration with the relevant stakeholders on the case studies' sites.
A recommendation may be to give an outline of the outcomes of the interactions with the SWIMTWIST and DAFNE projects, and how these influenced the course of the IN-WOP project, in particular as regards the DAFNE project.