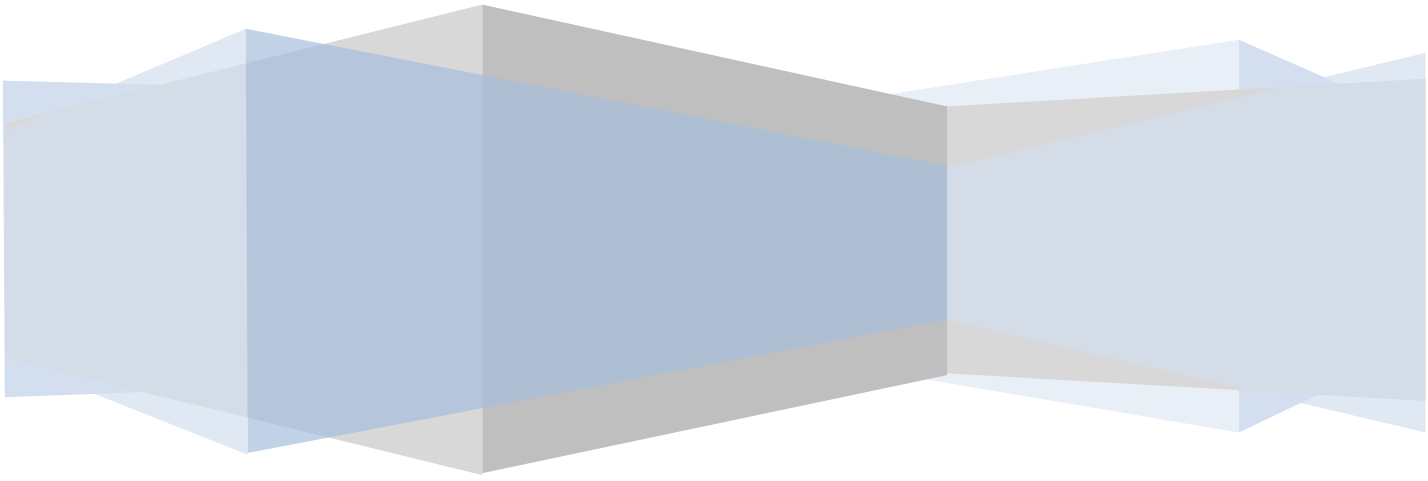
2018 Joint Call
Mid-Term Progress Report
Closing the water cycle gap - Sustainable management of water resources

Simulating tourism water consumption with Stakeholders (SIMTWIST)

This document must be filled in by the project coordinator with the help of its project partners and must be sent to the WaterWorks2017 Follow-up Secretariat by 31 October 2020.

The WaterWorks2017 Follow-Up Secretariat will ensure distribution to the concerned national funding agencies. The project coordinator is responsible for sending a copy of the report to its partners.



Simulating tourism water consumption with stakeholders (SIMTWIST)

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1. Publishable Summary

Maximum 1 page

In tourist destinations around the world, the tourism sector is increasingly adding to local and pressures on water supply systems, in particular in coastal regions, such as the Mediterranean. In the Mediterranean region, tourism puts substantial pressure on water supplies and competes with local users. While water demand is projected to increase, water availability will likely decrease. The simultaneous phenomena of climate change and tourism growth pose challenges to both the water utilities and the tourism industry. The SIMTWIST project aims to 1) estimate tourism's share in current and future macro-level water scarcity in the Mediterranean, and 2) study and simulate water-related behaviour of tourism stakeholders at the micro-level. The project's ultimate goal is to inform tourism decision-makers about the effectiveness of a variety of measures to reduce tourism's water consumption. Benidorm (Spain) and Rimini (Italy) are the project's case study areas.

We have scoped the water systems in both case study areas in terms of water resources, water infrastructure, stakeholders involved and behaviour. The water supply systems of the two study cities have been analysed and summarised. Collection, validation and analysis of existing quantitative water data is under way to estimate past water availability and consumption at different temporal scales both for sets of single costumers and for entire municipalities or water districts. Observed climate data (temperature and precipitation) for the case study areas have been identified, validated and analysed; future climate projections have been identified and are under analysis.

To elicit stakeholders' perspectives on the water system in the case study areas, eleven extensive stakeholder interviews were conducted in Benidorm and three in Rimini (the four remaining ones to be carried out in October). Each interview results in a graphical representation of the interviewee's perception of the system, containing its key elements as well as the relationships between them. Combining and integrating these individual representations/maps, the project team is now developing a core system map for each case study area. These core maps will be discussed with stakeholders at a dedicated workshop in order to arrive at a generally accepted system representation. In combination with the interview sessions, a questionnaire on social learning has been designed and translated, and completed with the stakeholders. The results feed into the hydrosocial cycle analysis, producing insights about why, when and how stakeholders are connected and which driving forces and barriers respectively foster and hinder improvements in water governance.

With these analyses, the groundwork is being laid for the agent-based model that will be developed in the second half of the project. This agent-based model, which represents the water system's stakeholders and their behaviour in the physical context of each of the case study areas, will be used to simulate the effects of a range of potential measures to reduce tourism's water consumption.

More information can be found on the project website: www.simtwist.eu.

2. Work Performed and the Results achieved during the reporting period

a. Scientific and technological progress

Work Packages 1, 2, 3 and 4 had tasks and milestones associated to the first 16 months of the project. Task 1.1 of the proposal included:

- *Collection of available data sets (water supply and demand)*. The available datasets on water supply and demand have been obtained from the main regional water suppliers in Rimini (RomagnaAcque) and Benidorm (Marina Baja Water Consortium) and the main retail water company in Rimini (HERA SpA). Data from the main retail water company in Benidorm (HIDRAQUA) are not available yet and when they become available, validation will be needed. Part of the consumer data supplied by HERA SpA has also not been validated yet. Validation and analysis of the collected data is ongoing. The data collection for Benidorm has taken place in close multi- and inter-disciplinary collaboration between the geographers of the Alicante team, who have collected the actual data, and the hydrologists of the Bologna team, who need the data for the quantitative water resource analysis. The water supply systems of Benidorm and Rimini have been described; see Appendix 1 and Appendix 2 respectively.
- *Collection of information on existing measures and policies*. This part has been merged with Task 2.2. See Task 2.2 for a description.
- *Scientific review of the state of the art on tourism water footprints in coastal areas*. This part is in progress. The project team has assembled a substantial number of relevant publications on the Microsoft Teams site. A partial analysis has been performed, but the full analysis has not been completed yet.
- *Analysis and validation of existing climate scenarios in the case study areas*. The Bologna and Alicante teams have i) identified, collected and analysed the historical climate data available in the two study areas and ii) reviewed the available climate scenarios and models that are currently used as a reference by the local stakeholders. The reference regional climate models are not the same in the two countries, which makes comparison of results difficult. The project team therefore decided to use EuroCordex simulations, which are available for the whole of Europe. Comparisons of the scenario simulations with observed data (EOBS) over the past decades are ongoing. These comparisons and analyses are somewhat delayed due to difficulties in the interaction with local climatology experts during lockdown. Two Representative Concentration Pathway (RCP) scenarios have been chosen, based on data availability: RCP4.5, which is roughly compatible with a 2.4 degree increase in global temperature; and RCP8.5, which represents a 4.3 degree temperature increase. Unfortunately, no model data are available for RCP2.6, which is considered compatible with the 2 degree target of the Paris agreement.

Task 1.2 was:

- *The design of water metering campaigns (to be done only in Rimini)*. The Rimini water utility company (HERA) takes care of the initial smart-metering campaign, but the deployment is late due to COVID restrictions. When the HERA smart meters have been deployed, the Bologna team will implement additional instruments to complement the HERA smart-metering system. The identification of suitable, representative users to be monitored and the choice of the metering devices are ongoing.

Task 1.3 was:

- *Smart monitoring (water metering)*. Due to the delay in task 1.2, the execution of this task will start later.

Task 1.4 was:

- *Development and validation of the water demand models*. Work on this task started recently and there are no results to be reported yet.

Task 2.1 was:

- *Development of scenarios (narratives and quantitative indicators) for tourism development that are consistent with the climate change scenarios used.* This task is in progress. Together with scenario experts Kasper Kok (WUR) and Kari Hyytiäinen (University of Helsinki), we are developing scenarios for tourism in Europe that are compatible with the RCP4.5, RCP8.5 (and perhaps RCP2.6) climate scenarios that we use in SIMTWIST.
- Methodology: We have itemized the factors, actors and sectors relevant for tourism, with a particular focus on Europe. Using the CLIMSAVE model, SSP IIASA database and other relevant literature as sources, we are now simulating and calculating the direction & magnitude of change of drivers and their impacts for combinations of SSPs and RCPs. These numbers will provide the basis for draft integrated qualitative storylines, which will be finalized after a round of feedback from experts.

Task 2.2 was:

- *Identification and description of intervention options*. This task is in progress. We have compiled a database of regional and national policies related to water conservation in the tourism industry in Europe, focusing on regional policy interventions in Spain and Italy. This database contains various types of documents (scientific publications, local regulations, national policies, among others). In the database, interventions are described in terms of 30 attributes, including the promoter of the intervention, the target group, when and why the intervention was applied, and examples of the application. The database includes a characterization of the type of measure (technical, planning, management, economic, governance), scale of intervention and stakeholders involved

(hotel, public administration, tourist sector, commercial or industrial users, water utilities, farmers), and the frequency with which each intervention has been applied. See Appendix 3 and Appendix 4 for the databases for Spain and Italy respectively. Data analysis for the Benidorm case study (Spain) has been completed, and a summary of intervention options has been produced (see Appendix 5). Data analysis for the Rimini case study (Italy) and Europe is in progress. The intervention options will be discussed with stakeholders (WP3 and WP4) to gauge the support for and perceived effectiveness of the various options.

Task 3.1 was:

- *Design of the survey/interviews campaigns*. This task has been completed regarding the interview design. Considerable synergies could be achieved by integrating the interviews for WP3 (Participatory Modelling) and WP4 (Hydrosocial Cycle analysis), because the same group of stakeholders was targeted and the questions partially overlapped. In addition, we wanted to avoid overburdening the stakeholders. As a result, interviews were designed to accommodate data collection for both WPs in the same session. Part one of the interviews consists of open questions pertaining to the Participatory Modelling WP in order to elicit each stakeholder's unique perspective and views of the complex water system, mapping a concept model of the tourism-water system; and part two consists of a set of multiple-choice questions (in the form of a questionnaire) about the interviewee's perception of their role in their water system and the extent to which they feel represented. The Spanish version of the guide for the interviews with three stakeholder groups for WP3 can be found in Appendix 6 (tourism sector), Appendix 7 (water sector) and Appendix 8 (irrigators). The questionnaire design for WP4's Hydrosocial Cycle analysis is attached as Appendix 9.
  The design of the survey campaign among tourists has been partially completed. A literature review of survey design methods is ongoing, but the design work was put on halt in the spring of 2020 as soon as it became clear that due to the COVID-19 crisis, it would not be possible to carry out the survey campaign among tourists in the summer of 2020. The design of the survey campaign will resume in the spring of 2021 in anticipation of a new attempt at completing the survey campaign in the summer of 2021.

Task 3.2 was:

- *Participatory modelling process, including interviews and simulation sessions*. All eleven interviews for the Benidorm case study area were performed in January/February 2020, along the lines of the interview design described under Task 3.1 (see Appendix 10 for a list of stakeholders). The conceptual maps produced with the stakeholders were subsequently analysed, and revisited with the stakeholders during a second round of interviews in July. The conceptual maps form the basis for a stakeholder workshop,

centred on Group Model Building. Due to the COVID-19 crisis, the workshop cannot be held in the format that was originally envisioned. Instead it is split up into two parts: 1) a half-day online workshop in November to discuss the individual conceptual maps and identify similarities and differences; and 2) an off-line workshop in the spring of 2021 (if the COVID situation allows) to engage in Group Model Building.

Interviews with key stakeholders (see Appendix 11 for a list of stakeholders) in Rimini were scheduled for March/April 2020, but they were cancelled/postponed due to the COVID-19 outbreak. Two interviews were conducted online via video conference in May 2020, one interview was conducted online in September and the remaining four will be carried out online in October. See part 2c for more detail about the interviewees belonging to the Benidorm and Rimini case study areas. The Bologna team has identified the Rimini stakeholders and engages with them. In close multi- and interdisciplinary collaboration with the Wageningen and Alicante teams, it also takes part in all the WP3 interviews and the administering of HSC questionnaires WP4, and has translated the questions for both.

Task 4.1was:

- *Design of the interview campaign*. This task has been completed. See Task 3.1.

Task 4.2 was:

- *Interview/surveys with stakeholders and consumer profiling*. This task has been partially completed. The questionnaires administered to the eleven interviewees in Benidorm (see Task 3.2) were all retrieved and analysed. Together with the interviews' transcriptions, the questionnaire results helped to identify stakeholders' attitudes regarding water governance and decision-making processes, which are important inputs for the Hydrosocial Cycle Analysis of WP4. The collection of the Rimini questionnaires is ongoing, due to the delays in the interviews.
  The survey of end-users (tourists) could not be carried out as scheduled during the summer of 2020 due to the COVID-19 pandemic. See also task 4.1.

Task 4.3 was:

- *HSC approach applied to Rimini and Benidorm case studies*. This task has been partially completed. The questionnaire for tourism stakeholders was administered to all eleven interviewees in Benidorm (see Task 3.1); in Rimini, the stakeholder interviews are still ongoing. The questionnaire is the key tool to elicit stakeholders' attitudes regarding governance and decision-making in coastal mass tourism destinations. To make the HSC approach suitable for analysing the water-tourism nexus in coastal mass tourism destinations, we had to adapt existing methods and tools and develop new ones. As part

of this methodological innovation, we reviewed the literature on the Stakeholder Analysis and Governance Model approaches. We analysed the results from the Benidorm questionnaire with a number of constructs from this literature, in particular the contrasting notions of Interest-Influence-Power, Collaboration-Confrontation, Representation-Involvement, and Interaction-Relationships. We also identified a number of available visualisation tools - including stakeholder map, two-way matrix, scatter plot, and network analysis - as potentially applicable to both case studies. The administering of the questionnaire to the Rimini stakeholders is in progress. See Task 3.2.

Task 5.1 was:

- *ABM in current scenario (using historical data).* Work on this Task has recently started and is in progress. The key features of a first model are currently being defined, including the actors (main stakeholders and their behaviours, based on the results from WP3 and WP4), the environment (the physical context, based on the results from WP1) and external scenarios (key factors such as climate change and policy measures, which are not modelled explicitly, based on the results from WP2). The formalization will be documented in an Overview, Design concepts, and Details (ODD) protocol, the basis for model coding.

Task 6.1 was:

- *Dissemination.* The dissemination tasks have focused on publicizing the project through the website, the distribution of flyers (in Spanish) to the stakeholders interviewed in Benidorm, and the publication of the project's progress on social networks (Twitter and Facebook). The project website is available in English, Italian and Spanish. The flyers were also printed in all three languages to be able to cater to the local stakeholders (Spanish, Italian) as well as the international scientific community (English). Dissemination has also taken the form of teaching: during her stay in at Wageningen University, Sandra Ricart conducted a session called "Hydrosocial Cycle Analysis: Approach and Implementation" for the students of the BSc Tourism course "Tourism system analysis".

b. Collaboration, coordination and mobility

The SIMTWIST project is a relatively small project with only three partners, with highly complementary knowledge and skills. To benefit from this complementarity, the work is organised in multi-partner Work Packages, each led by the partner with the highest level of disciplinary expertise: the University of Bologna for water resource analysis; the University of Alicante for hydrosocial cycle analysis; and Wageningen University for companion and agent-based modelling. This setup has been effective and has promoted multi- and inter-disciplinary learning. Also on a personal level, the team members get along very well. The transnational

nature of the project is in constant focus, because of the two case study areas: one in Italy and one in Spain. Whereas the work on each case study area is performed separately to some extent, great care is taken to work from a uniform design. The approaches taken to develop scenarios and hydrological models, to interview stakeholders, and to perform the hydrosocial cycle analyses, for example, are discussed by the whole team to ensure alignment between the various tasks.

Funding issues have led to substantial complications. The Spanish partner did not secure their funding until January 2020, while the funding for the Italian partner is still waiting for final approval. The lack of funding impeded the hiring of new staff and forced the partners to pay the salaries of assigned staff from other sources. Despite the financial trouble, however, both teams have been fully engaged with the project from the beginning to ensure compliance with the project schedule.

Coordination between the partners has worked well. We held a kick-off meeting in Wageningen in June 2019 to further articulate the project's objectives, tasks and deliverables, and also to further clarify the roles and responsibilities of each of the partners. During the first half of the project (June 2019-September 2020) we have held 1 annual meeting and 11 online monthly meetings (no meetings in summer and after the Christmas holiday season) to keep each other posted, discuss progress and coordinate tasks. These monthly meetings have always been well-attended, with at least two thirds of team members present. Since the work in the various work packages requires close collaboration, smaller task-oriented teams have been working together on an almost daily basis. In particular the post-doc researchers of the three partners have established close working relations.

In terms of mobility, four events can be mentioned. Maria Reyes visited the James Hutton Institute at the end of 2019 to collaborate with Dr. Matt Hare, an expert on participatory processes and agent-based modelling. The collaboration with Dr. Hare has been very instrumental in developing the methodologies related to stakeholder interaction. In November/December 2019, Bas Amelung (Wageningen University) visited Alicante University as a member of the evaluation committee for Rubén Villar (currently one of the project's post-docs), who defended his PhD thesis on 29 November 2019. During the same visit, he also met with Jaime Berenguer, chief engineer of the Marina Baja Water Consortium, a meeting that was organised by colleagues from Alicante. In January and February of 2020, in close collaboration with the Alicante team, Maria Reyes performed interviews with eleven stakeholders involved in the tourism water system in Benidorm. In February/March 2020, Sandra Ricart (Alicante University) visited Wageningen University on a research fellowship offered by the Wageningen Institute for Environment and Climate (WIMEK), one of Wageningen University's graduate schools. During the visit, Sandra attended an expert meeting discussing a MOOC on Tourism and Climate Change, gave a lecture on Hydrosocial Cycle analysis for BSc Tourism students, and worked together with Maria Reyes (Wageningen University) to transcribe and analyse the fifteen interviews that they had conducted in the

weeks before. Unfortunately, Sandra had to abruptly abort her stay in Wageningen because of the COVID-19 outbreak, a few days earlier than her scheduled departure.
The collaboration between the project partners also extended to the supervision of MSc and BSc thesis students (see also 2c). One MSc thesis student from Wageningen University (WUR) works on the water and energy saving measures implemented or considered in the hotel sector in Benidorm, in close collaboration with and building on results from the Alicante team. A second WUR MSc student was planning to write her thesis about climate services in Benidorm's tourism sector, but aborted her plans when the COVID-19 crisis erupted. A third WUR MSc student writes her thesis about stakeholder participation in water governance in Rimini and has a substantial role in conducting the remaining interviews with the Rimini stakeholders. This student is in close collaboration with both the Bologna team (for case information, contacts with the stakeholders) and the Alicante team (for methodological support). A fourth WUR MSc. student is currently analysing water demand intervention policies in the tourism sector, which she aims to relate with tourist profiles and archetypes, in collaboration with the Alicante team. A WUR internship student currently helps process the Benidorm concept maps and plan the online workshop that will be held at the end of November 2020. Three thesis students from the WUR's BSc Tourism program wrote their thesis reports about the water footprint related to tourists' consumption of food and drinks in Benidorm, with much support from the Alicante team. One BSc thesis student wrote her thesis about the factors that influence water use by hotels, with a case study in Rimini and supported by the Bologna team.

c. Impact and knowledge output

The main impacts of the project relate to the modelling and analysis phases of the project, which will be carried out in the latter half of the project. However, since the expected beneficiaries of these impacts are stakeholders from the tourism industry and from policy making, establishing and maintaining close relationships with those stakeholders is essential. On this front, substantial progress has been made. In Rimini, two stakeholder interviews were performed in the spring of 2020 (during the lockdown), strengthening these stakeholders' interest in and commitment to the project. One additional Rimini stakeholder was interviewed in September and four more will be interviewed in October; for some of them (especially those involved in touristic activities) the interviews will be the first direct involvement in the project and they are responding very positively.
In Benidorm, connections with all major stakeholders have been strengthened through the eleven interviews conducted. Thanks in part to the existing research collaboration between the Alicante University team and most of the stakeholders, all interviewees responded very positively and enthusiastically to the project's objectives, as well as to the interview, and are keen on being involved in the rest of the project. In the summer, the conceptual maps produced during the interviews were revisited during individual online sessions to prepare for

the Group Model Building workshop, which had initially been scheduled for October but was postponed until the spring of 2021, with a short meeting taking place online in November (See section 2a, Task 3.2). In the November meeting, the stakeholders will come together to discuss the integrated results from the interview round, including similarities and differences between their perceptions of the same system. At the spring (hopefully in-person) workshop all major stakeholders will convene to build on this groundwork and work towards a joint-consented model. The workshop will include several dynamic activities, where stakeholders will interact and engage in social learning. In addition, they will gain knowledge from different perspectives and will help to create a more complex core model and to validate different aspects of the model. This workshop will provide stakeholders with a safe space to interact and express their opinions.

Several BSc and MSc students from Wageningen University have written and are writing their thesis about topics pertaining to or adjacent to the project, potentially strengthening and broadening the project's impact (see also section b). Three BSc Tourism students have written their thesis about the water footprint of food and drinks consumed by tourists in Benidorm. This indirect water consumption by tourism is just outside the project's scope, but provides interesting new perspectives, especially for the ABM. A substantial share of the food and drinks consumed by tourists in Benidorm is produced in the Benidorm-Alicante region and therefore adds to the regional water demand. An MSc student investigates the water-energy nexus in hotels, looking at the main barriers and drivers of the hotel sector in Benidorm to introduce water and energy saving measures. This research builds upon prior research by the Alicante team and its results will find their way into the project's agent-based model(s).

Three MSc students from the University of Bologna have been involved in water data collection and analysis, developing their Master theses along with an internship with the water utilities (2 students with HERA and 1 student with RomagnaAcque) and helping in the downloading, collection, validation of water demand data at micro (single costumers) and macro (volumes in input to the municipal network) scales.

Table of Deliverables

Deliverable name	Lead partner (country)	Date of delivery (dd/mm/yyyy)	Changes, difficulties encountered and new solutions adopted
WP1			
D1.1: Policy briefs on tourism-related water consumption	UB (IT)		At the kick-off meeting in Wageningen in June 2019, we decided to split D1.1 into two deliverables: D1.1 policy brief on tourism water demand, and D1.2 policy brief on future tourism water demand. Both are in progress.
D1.2: Tracking indicators	UB (IT)		At the kick-off meeting in Wageningen in June 2019, we decided to change D1.2 into D1.3 Report on current and future water supply. This deliverable is in progress. The descriptions of the water supply systems of Benidorm and Rimini (Appendix 1 and Appendix 2) will be part of it.
WP2			
D2.1 (unplanned): Database of water-tourism interventions, extracted from policy documents and the academic literature	UA (ES)	06/04/2020 and 15/07/2020	Given the wide scope and complexity of the review of intervention options, we decided to structure the operation by creating a database of intervention options and 30 of their attributes. This database also merits the status of deliverable. Two type of sources have been prioritized: policy documents and literature review at local, regional, national and European level. For the Spanish case study, the database has been completed (Appendix 3) while the database for the Italian case study (Appendix 4) is partially completed.

Deliverable name	Lead partner (country)	Date of delivery (dd/mm/yyyy)	Changes, difficulties encountered and new solutions adopted
D2.2 (unplanned): Summary of intervention options aimed at water conservation in the tourism industry, extracted from the Spanish literature and policy database (Benidorm case study)	UA (ES)	06/04/2020	As a second new deliverable, we added the summary of intervention options for the Benidorm case study area. This summary includes local, regional and national options and could be relevant for similar research contexts. The summary is attached as Appendix 5.
WP6			
D6.1: stakeholder meeting month 3	WUR (NL)		In order to make the most efficient use of stakeholders' time and commitment, we decided to conduct individual interviews first, before organizing a meeting. A stakeholder workshop is scheduled for October 2020. Due to COVID-19 it will take place online, rather than in Benidorm, Spain.
D6.2: website and social media	WUR (NL)	September 2019	During the first months, the following outreach-related items were created: a SIMTWIST logo; a flyer to be distributed at conferences (in English) and shared with stakeholders and general local audiences (in Spanish and Italian), a Facebook page and a Twitter account of the project (maintained by the Alicante team) and a project website (description of the project, meetings, results, news items and other relevant information; maintained by the Wageningen team).

3. Budget review

Wageningen University: 116.5k euro, mainly consisting of personnel costs (106k euro) and travel and subsistence costs (7.5k euro). Alicante University: 44.5k euro, mainly consisting of personnel costs (43k euro) and travel and subsistence costs (1.3k euro) University of Bologna: 0 euro, since funding is not available yet. The only costs so far (to be reimbursed when funding will be available) are travel & subsistence costs related to the kick-off meeting in June 2019.

4. Consortium Meetings

N°	Date	Location	Attending partners	Purpose/ main issues/main decisions?
1	25-27 June 2019	Wageningen, NL	WUR, UB, UA (all)	Kick-off meeting: making concrete plans for the first year
2	4 Sept 2019	Online	All	Monthly meeting
3	8 Oct 2019	Online	All	Monthly meeting
4	6 Nov 2019	Online	All	Monthly meeting
5	2 Dec 2019	Online	All	Monthly meeting
6	4 Feb 2020	Online	All	Monthly meeting
7	11 Mar 2020	Online	All	Monthly meeting
8	1 Apr 2020	Online	All	Monthly meeting
9	14 May 2020	Online	All	Monthly meeting
10	16-17 June 2020	Online	All	Annual meeting
11	15 July 2020	Online	All	Monthly meeting
12	9 Sept 2020	Online	All	Monthly meeting

In addition to the plenary consortium meetings, consortium members have engaged in numerous bilateral and other smaller meetings to address topics such as the hydrosocial cycle in Rimini, interview and workshop preparations, climate models, and water supply and consumption data.

5. Stakeholder/Industry Engagement

The project has been very successful in engaging stakeholders. In fact, much of the work so far has centred on stakeholder engagement. In Benidorm, stakeholders were first approached by informing them about the project and its relevance for them. After this, interviews were conducted with the following eleven stakeholders: Consorcio de Aguas de la Marina Baja (22/01/2020), HIDRAQUA (15/01/2020), Confederación Hidrográfica del Júcar 21/01/2020), EPSAR (31/01/2020), Ayuntamiento de Benidorm (15/01/2020), Consejería de Turismo (21/01/2020), Consejería de Urbanismo (20/01/2020), HOSBEC (14/01/2020), Comunidad de regantes del Canal Bajo del Algar (14/01/2020), Comunidad de regantes de Villajoyosa (27/01/2020), and Comunidad de regantes y usuarios de Callosa d'En Sarria (22/01/2020). The interviewees provided their perspective on the tourism-water system in Benidorm, information that will feed into the development of a serious board game and an agent-based model. After the first round of interviews, the information provided by the stakeholders was analysed and the concept maps were refined. The maps were sent back to the stakeholders for verification, and subsequently revised during an online session with each of the stakeholders in July. All stakeholders indicated a keen interest in the project and its objectives, and expressed their appreciation of the participatory process.

In addition to participating in the interview round, Hidraqua provided data on water consumption in Benidorm and the Consorcio de Aguas de la Marina Baja provided data on water supply to Benidorm. ABRECA - the Benidorm association for bars, restaurants and cafeterias - has been very helpful and instrumental in designing the survey to solicit information from restaurants in Benidorm about amounts of food and drinks sold. This is very important information, because a large share of tourists' water footprint consists of water that is embodied in (i.e. used during the production of) food and drinks. Once the survey of tourists is completed, the information on food and drinks will be used to develop tourist profiles with respect to water consumption.

In Rimini, three stakeholders were interviewed: RomagnaAcque (22/04/2020), the main regional water supplier in Rimini, and Hera SPA (13/05/2020), Rimini's retail water company. Four additional interviews are planned for October. Like in Benidorm, the interviewees provided their perspective on the strengths and weaknesses of the local water system and on the tourism-water nexus, information that will feed into the development of a serious board game and an agent-based model. And similar to the stakeholders in Benidorm, the stakeholders in Rimini are enthusiastic about the project and its objectives, and are keen to collaborate. In addition to participating in the interviews, RomagnaAcque and Hera SPA also supplied large sets of detailed quantitative data on water supply, including the information needed to analyse the exploitation of the sources during both 'average' and dry periods, and on water demand at both aggregated (municipality and water district) and individual consumer level.

6. List of Publications produced by the Project - Open Access

International	Peer-reviewed journals	1. Ricart S., Arahuetes A., Villar R., Rico, A.M., Berenguer J. (2020). More water exchange, less water scarcity? Driving factors from conventional and reclaimed water swap between agricultural and urban–tourism activities in Alicante, Spain. *Urban Water Journal* 16(10): 677-686. Doi:10.1080/1573062X.2020.1726408. 2. Amelung B., Ricart S., Villar-Navascués R., Rico-Amorós A.M., Toth E., Reyes M., Bragalli C., Neri M., Hernández-Hernández M. (2021). Coping with water scarcity and climate change in tourism destinations: literature review and research agenda. *Current Issues in Tourism* (in preparation). 2. Amelung, B., Kok, K., Hyytiäinen, K. (2021). Future prospects for tourism in Europe under changing society and climate. *Regional Environmental Change* (in preparation). 3. Reyes, M., Ricart, S., Villar-Navascués R, Amelung B., Rico-Amorós A.M, Concept mapping as an input of social network analysis: an analysis of differences and similarities. (in preparation)
	Books or chapters in books	1. Ricart S. (2020). Water governance and social learning: Approaches, tools, and challenges. In: Leal Filho W., Azul A.M., Brandli L., Lange Salvia A., Wall T. (Eds.): *Clean Water and Sanitation. Encyclopedia of the UN Sustainable Development Goals*. Springer: Cham. Doi:10.1007/978-3-319-70061-8_152-1. 2. Villar R., Arahuetes A. (2020). The hydrosocial cycle: Understanding water as a socionatural production. In: Leal Filho W., Azul A.M., Brandli L., Lange Salvia A., Wall T. (Eds.): *Clean Water and Sanitation. Encyclopedia of the UN Sustainable Development Goals*. Springer: Cham (in press). 3. Ricart S., Villar R., Rico A.M. (2020). Water exchange and wastewater reuse to achieve SDG 6: How to reduce water scarcity and water pollution? Learnings from Benidorm (Spain). In Cissé G. (Ed.): Transitioning to clean water and sanitation. MDPI Books: Switzerland (in press).
	Communications (presentations, posters)	1. Villar-Navascués, R. A., Baños, C., Hernández, M., & Olcina, J. (2020). Is efficiency in water management an alibi for the growth of tourism? In XVII International Coloquium on Tourism. AGE-IGU. Mao (Spain, 6th to 10th October, 2020).
National	Peer-reviewed journals	1. 2. 3.

(separate lists for each nationality)	Books or chapters in books	1. 2. 3.
	Communications (presentations, posters)	1. 2. 3.
Dissemination initiatives	Popular articles	1. 2. 3.
	Popular conferences	1. 2. 3.
	Others	1. Maria Reyes presented the SIMTWIST project during her research visit to the James Hutton Institute in Aberdeen (Scotland). 2. Sandra Ricart presented the SIMTWIST project during a lecture and workshop on Hydrosocial Cycle analysis for BSc Tourism students, as part of her research visit to Wageningen University. 3. Project activities, such as fieldwork and research visits and stakeholder interviews have regularly been published on the website, the Facebook page and Twitter.

7. Knowledge output transfer

Short Title	Interview Design for WP 3 (Concept model)
Knowledge Output Description	The interview design includes an open-interview script developed to elicit stakeholders' perspectives on important aspects of the water system. The script follows a participatory modelling process, which starts with a variable (problem/vision), then explores that problem's causes, consequences, feedback and solutions. The questions cover important aspects of the water system (e.g. water availability, infrastructure), potential threats and problems (e.g. climate change, tourism), potential solutions (e.g. demand reduction) and finally potential future scenarios.
Knowledge Type	guidelines/standards
Link to Knowledge Output	Not publicly available yet. The design will be shared as a deliverable when the results obtained with the protocol have been published.

Sectors & Subsectors	Stakeholder Involvement
End User	Education & Training Scientific Community
IPR	n/a
Policy-Relevance	
Status	Finalised

Short Title	Group model building protocol
Knowledge Output Description	This protocol includes a step-by-step description of the process of generating individual concept models and integrating them into one, then validating the models and finally creating a common core model that can be used for group model building. This protocol is useful for academics and/or scientists that need to understand complex systems from different perspectives and wish to develop one common model that could be the ontology for an Agent-Based Model.
Knowledge Type	RTD protocol/technical manual
Link to Knowledge Output	Not publicly available yet. The protocol will be shared as a deliverable when the results obtained with the protocol have been published.
Sectors & Subsectors	Stakeholder Involvement
End User	Education & Training Scientific Community Civil Society
IPR	n/a
Policy-Relevance	
Status	In progress. In particular the protocol for creating a common core model is still under development.

Short Title	Participatory process protocol
Knowledge Output Description	This protocol describes step by step how the participatory process will be executed during the entire project's lifespan, from the interview sessions until the final workshop where final results will be shared and discussed. It describes the unique combination of methods that make the participatory process interesting and dynamic, and most importantly, appealing to

	stakeholders, so that they are willing to participate.
Knowledge Type	RTD protocol/technical manual
Link to Knowledge Output	Not publicly available yet. The protocol will be shared as a deliverable when the results obtained with the protocol have been published.
Sectors & Subsectors	Stakeholder Involvement
End User	o Education & Training o Scientific Community o Civil Society o Other
IPR	n/a
Policy-Relevance	
Status	Finalised

Short Title	Questionnaire design for WP4
Knowledge Output Description	The questionnaire design includes 11 questions aimed at eliciting how stakeholders perceive their participation in decision-making processes focused on water management. Questions are organized in four main sections: interest vs influence in decision-making processes, collaboration vs confrontation between stakeholders, representation in decision-making processes, and interaction between stakeholders. The results shed light on each stakeholder's own and external representativeness, and on current and potential drivers and barriers for (dis)agreement among stakeholders.
Knowledge Type	guidelines/standards
Link to Knowledge Output	Not publicly available yet. The protocol will be shared as a deliverable when the results obtained with the protocol have been published.
Sectors & Subsectors	• Others o Governance o Stakeholder Involvement
End User	o Education & Training o Environmental Managers & Monitoring o Policy Makers / Decision Makers o Scientific Community

	o Civil Society
IPR	n/a
Policy-Relevance	The knowledge-output is relevant for any policy context in which relationships between stakeholders and the potential for conflict are addressed explicitly.
Status	Mostly done

8. Open Data

In relation to Open Data, the SIMTWIST projects will submit metadata on all the resources directly generated by the project, as well as additional information on how these data will be exploited, if and how data will be made accessible for verification and re-use, and how they will be curated and preserved. Metadata on all project resources will be submitted as part of the final reporting. This will be done via the **Open Data & Open Access platform**, available at: http://opendata.waterjpi.eu/ (also accessible from the bar menu of the Water JPI website).

9. Problems Encountered during Project Implementation

- Two of the partners encountered difficulties related to the availability of funds at the national level. The Spanish partner went through a national trajectory to obtain national funds; this trajectory was successfully completed by the end of 2019, so it was not until January 17, 2020 that the two post-doc researchers could be hired. The Italian partner is going through a national review process, which has not yet been completed due to the unavailability of suitable reviewers. No funding is available to the Italian partner to date.
- The delay in national funding has led to long periods of understaffing, even though this has so far not resulted in delays in project execution thanks to the predisposition and full (unpaid) involvement of the team members of both partners. The Spanish partner has been working at full strength with the two post-doc researchers duly hired from the beginning of 2020; the Italian partner has so far not been able to contract their post-doc.
- The project is also suffering from the COVID-19 crisis. A series of interviews in Rimini which had been scheduled for March and April 2020 had to be cancelled. In addition, the annual meeting which was scheduled to be held in Alicante in June 2020 had to be replaced by a video conference. We hoped to have a belated live consortium meeting in Alicante in October, organised back-to-back with a stakeholder workshop, but travelling to Alicante is not allowed. Also, other fieldwork activities have been postponed, such as surveys among tourists in Benidorm and Rimini, which were originally scheduled for the summer of 2020. The design and start of the water metering campaigns in Rimini, to be developed in close cooperation with the water utility HERA, have been delayed due to the COVID-19 crisis: no field surveys were possible and the overall HERA metering project has been postponed.

10. Suggestions for improvement regarding project implementation?

For the viability, stability and success of any JPI project, it is critical that funding for all partners is secured ***before*** the project's start. Therefore we would suggest to review the alignment between the JPI grant trajectory and the national funding trajectories to make sure that any national procedures can be finalised before the projects formally start.