



Living-lab on improving groundwater governance in the Requena-Utiel aquifer

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ABSTRACT

The European research projects InTheMED and eGROUNDWATER share the aim of promoting innovative and sustainable management of the Mediterranean aquifers. One of the ways to achieve this objective is the creation of dynamic spaces in which all interested actors can cooperate, experiment and evaluate innovative ideas, different scenarios and new technologies on real cases of interest. In this regard, a living lab on improving groundwater governance, coordinated by the eGROUNDWATER team with the participation of the InTheMED team, was organized including all stakeholders who play a significant role in the management of the Requena-Utiel aquifer, which is a shared pilot site of the two projects. The aim of the living lab was to identify, together with stakeholders, problems and mitigation measures, and to evaluate possible strategies to satisfy the individual needs according to a sustainable use of the groundwater resources.

1. Introduction

The management of aquifers all around the world is a challenging task that cannot be achieved without inclusive participation. The projects InTheMED and eGROUNDWATER are part of the PRIMA Programme and, among other things, have the complementary mission of implementing innovative, sustainable, and participatory management tools for Mediterranean aquifers to mitigate anthropogenic and climate-change threats. To do this successfully, the creation of new long-lasting spaces of social learning among different interdependent stakeholders, NGOs, and scientific researchers is crucial. A first step towards a participatory aquifer management has been taken in Requena, Spain, where a living-lab on improving groundwater governance took place on the 4th of March 2022 with the participation of 28 people related to groundwater use, protection, and research including environmental technicians, individual users, irrigation community representatives, researchers, Requena and Utiel City Hall personnel and an ONG member. The main objective of the living lab was to arrive at a diagnosis of the problem of groundwater unsustainability and perform a brainstorming exercise about possible measures, technological needs, and tool design. In this work, we share our experience on conducting such living-lab and explore its strengths and weaknesses regarding the mitigation of anthropogenic and climate-change threats.

2. The living lab

Based on the information obtained during the year 2021 after some interviews with the stakeholders, the living-lab was organized in three sessions as follows:

In the first session, a successful case of irrigation advisory service in groundwater management in La Mancha Oriental aquifer, about 50 km far from Requena, was presented. It was shown that the adequate management of groundwater resources can reverse the bad quantitative condition of an aquifer, provides considerable savings to the farmer, and stabilizes or even recovers piezometric levels. At the end, such presentation caused an interesting discussion about groundwater distribution and availability and aquifer recovering after management strategies.



In the second session, the main objective was to identify the problems in groundwater management and distribution. The participants were divided in two groups for a balanced participation of stakeholders and each participant, individually, was invited to write on post-it notes the main problems related to the use and management of the groundwater in Requena-Utiel; these notes were placed on a large whiteboard for conceptual mapping (Figure 1a). Next, the main problems identified by all the participants were voted in a qualitative manner through a Likert scale, from very important to irrelevant for the management of groundwater. Finally, the two groups were put together to discuss the issues identified (Figure 1b). In this session, the problems mentioned by stakeholders were, among others, lack of (reliable) information about the aquifer, lack of studies of the aquifer and its piezometric condition, lack of control, risks related to groundwater quality in the future, slowness of the public administration, illegal wells, growing demand for water, production focused on quantity and not quality, the groundwater distribution is unfair (they think they could be allowed to use much more water than they are), and the complexity of the technical documents reporting the aquifer state.

In the third session, the groups continued their discussion from the second session by brainstorming about possible measures to achieve a good condition of the aquifer, technological needs, and tool design. This session followed the same method as in the second session, but now the stakeholders wrote on post-it notes the solutions or measures to deal with the problems related to the use and management of groundwater in the Requena-Utiel aquifer. Finally, measures were voted in a double Likert scale, in terms of effectiveness (from very effective to counterproductive) and acceptability (from very acceptable to non-acceptable). At the end of the third session, the two groups were put together to discuss the measures identified. Stakeholders were very optimistic about the use of tools based on Information and Communication Technologies (ICTs) to help manage the aquifer, such as web pages or mobile applications. They also mentioned the importance of remote sensing in the correct management of irrigated areas and stressed the value of the detailed study of the aquifer, with modern tools. They demanded more control of the private wells by the Jucar River Basin Authority. And finally, they cited the need for more didactic and summarized technical reports and presentations, since they are very interested in understanding more about the real state of the aquifer



Fig. 1. a: Problems in the groundwater management and distribution identified by the participants. b: The two groups of participants sharing the results of the second session.

3. Final comments

Although many participants agree that it is necessary to create more participatory spaces, study the aquifer more in detail, know its capacity, use ICT-based tools, and disseminate the information in a clear and simple way, there was no consensus on the bad quantitative condition of the aquifer. On the one hand, the main strength of the participatory workshop was the intense participation of stakeholders and their willingness to collaborate with the management of the aquifer. On the other hand, the contradictory speeches about the condition of the aquifer showed that the main weakness of this process was the lack of prior and reliable knowledge about the aquifer, due to the complexity of the reports on aquifer state.

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Reference

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