

● Promoting socio-hydrological interdisciplinarity

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Background

Water is both a feature of the landscape and a potential resource. Water builds alliances and creates conflicts, and the way it is shared and used links together various conceptions of the relationship that humans have with their environment. Water requires us to connect – and sometimes to confront – different visions of the world and its future. Building sustainable relationships between societies and water, between water and societies, requires us to negotiate compromises, which are never perfect. The role of research in this scenario is to provide the many stakeholders involved in water with the knowledge they need to understand these social, political and environmental issues. Water is therefore a powerful vector of interdisciplinarity. After all, how can we understand and support the social challenges of water without providing insight into its physical characteristics and vice versa? The SocioHydro team of the UMR G-Eau is committed to meeting this challenge by building, step by step, an interdisciplinary “socio-hydrological” practice.

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Further reading

MASSUEL S., RIAUX J., MOLLE F., KUPER M., OGIIVIE A., COLLARD A-L., LEDUC C., BARRETEAU O., 2018 – Inspiring a broader socio-hydrological negotiation approach with interdisciplinary field-based experience. *Water Resources Research*, 54 (4) : 2510-252.

Fieldwork at the heart of the interdisciplinary relationship

As we know, genuine dialogue between social and natural sciences is never easy, for reasons as diverse as epistemological differences and the way in which each discipline constructs its objects, its research questions and how they are answered. There are also differences in the way researchers approach their subject, with some seeking to be neutral and others seeking to be subjective. The wide range of pitfalls is matched by a wide range of practices that help to overcome the difficulties inherent in this dialogue.

The SocioHydro team's interdisciplinary dialogue really began with a research experiment in Tunisia, during which researchers in hydrological sciences and social sciences worked together over a long period on the same site: the Kairouan plain, the site of a vast aquifer, whose increasing exploitation raises a number of questions, in terms of both hydrogeology and anthropology. Several researchers, posted together in Tunis, built a research programme aimed at developing collective responses to the physical and social challenges of understanding this "resource". The dialogue was organised during collective field missions, through experimentation with the working methods of the disciplines involved, discussions on practices, on the assumptions made by each researcher and on their respective ethics. Exposing the inner workings of disciplines gives us an insight into what they are based on, what their limits are and, by the same

token, how the complement other disciplines. New research questions are then formulated, resulting from combining the views of the disciplines involved. In our case, the first step was to examine the history of the exploitation of the Kairouan aquifer and to understand why over-exploitation has become a red flag for the various stakeholders involved.

Listening to the field and its stakeholders

Interdisciplinary work provides the opportunity to construct new questions rooted in concrete situations and focused on the concerns of those working in the field. When it comes to shaping interdisciplinary research, researchers cannot blindly accept research questions that only work for their discipline, such as honing a data processing method or examining the foundations of a conceptual approach. Our experience in Tunisia has taught us that research questions shared by the researchers involved are built around issues that arise in the field and are defined by the conflicting viewpoints of water stakeholders on a specific situation. This is the case with the observation of "over-exploitation" of groundwater in Kairouan or "under-exploitation" of water in the small dams in the hills of Kairouan.

Very often, these conflicting viewpoints are the result of imbalances in knowledge, which researchers need to rebalance. This may involve making previously unheard viewpoints heard, as is often the case with local knowledge on water. In other cases, it may involve identifying and/or

fulfilling certain knowledge needs expressed by water stakeholders by producing new data and analyses. Sometimes it involves highlighting and encouraging water stakeholders to question the conflicting viewpoints they convey through their own discourse on water.

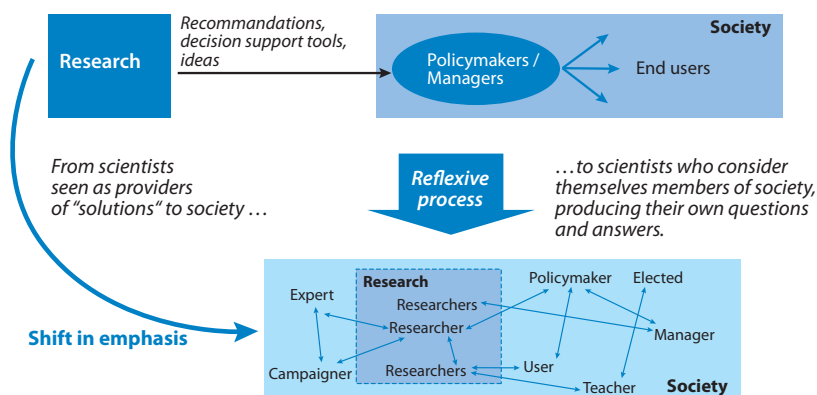
Thinking about the role of research in society

While working on the viewpoints that various stakeholders hold on the exploitation of the Kairouan aquifer, we wondered about the way in which researchers see their role vis-à-vis society. This question was discussed at a workshop led by the NAILA International Joint Laboratory (LMI NAILA – Water resource management in rural areas) entitled “What is the purpose of water research in Tunisia today?” (Tunis, 2018). Based on this deliberately provocative question, the LMI researchers

explored how they view and carry out dialogue with society. This helped us to make a shift in emphasis from talking about the usefulness of research to thinking about the functions of research in society (see figure below). Reflexivity on the part of the researcher is thus one of the essential outcomes of interdisciplinary dialogue.

Developing instruments for reflexivity

Fostering a collective reflexive process appears to be central to the success of interdisciplinary dialogue. The SocioHydro team is exploring several aspects of this goal. The first is sharing experiences from the field. The aim is to promote interdisciplinary research on the same field, but also discussion among those involved in these experiences. Interdisciplinary dialogue can, for example, take place



The reflexive process as a product of interdisciplinary dialogue.

between researchers working on the same hydraulic objects (hill dams, irrigation canals, etc.), but in different contexts or with different questions. The second is interdisciplinary writing. This involves encouraging several participants to write articles, thereby combining several field experiences, while at the same time reflecting on the writing practices specific to the disciplines concerned and on what these practices mean for the message being conveyed. Finally, the third component, which makes the first two possible, is creating and maintaining discussion and “breathing”

spaces that are always open and welcoming, where researchers from the natural and social sciences spend time discussing, exchanging viewpoints and listening together. Setting up these opportunities for sharing experiences and information provides a framework for interaction that has been carefully thought out in advance of the meetings (workshops, seminars, meetings), so that everyone taking part feels comfortable. This is essential if they are to overcome the reticence and discomfort inherent in interdisciplinary dialogue and express themselves freely.

KEY POINTS

What we now call “sustainability sciences” takes a wide variety of forms and covers – and sometimes conceals – a wide variety of scientific practices. At IRD, experience in the field, working in partnership and spending long periods of time working together on our projects have resulted in a unique way of interacting with the natural and social sciences. The balanced dialogue between researchers from different disciplinary backgrounds encourages them to pay attention to what is happening in the field and to the people involved, examining the variety of viewpoints on water and the impact on sustainability issues. This is the objective of the socio-hydrological approach adopted in various locations in West Africa, South-East Asia, the Maghreb and France.

SUSTAINABILITY SCIENCE

UNDERSTAND, CO-CONSTRUCT, TRANSFORM

Collective thinking coordinated
by Olivier Dangles and Claire Fréour

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