

## ISA of Water: The Ebro River Basin

The Ebro River Basin is located in the North-Eastern part of the Iberian Peninsula. It is the largest hydrological basin of Spain and flows into a delta that represents one of the richest wetland areas in the Mediterranean basin in terms of biodiversity. This case study studied this basin within the context of changes occurring in Spanish water policy mainly during the last two decades.

One of the most outstanding conflicts regarding Spanish water policy was related to the National Water Plan (NWP, presented in the year 2000 and approved in 2001), which proposed a water transfer from the Ebro river basin mostly to the South for intensive agriculture and coastal tourism. The NWP was highly criticised in Spain for not taking the social and ecological impacts

sufficiently into account, and because it framed the issue merely as an economic demand/supply optimisation question rather than considering systemic aspects of the river basin and landscape management. It was seen by a large sector of the Spanish population as a continuation of the 'old hydraulic paradigm' or 'culture', based on an endless increase of water supply, rather than for meeting local populations' needs. The NWP caused a wide social upheaval, manifested, for example, in the largest demonstrations on socio-environmental issues taking place in Spain for over two decades. A wide range of stakeholders built a new cross-cutting social movement and coordinated pressure group, named the 'New Water Culture' (NWC), which was intended to change the main water management orientation that

had dominated water policy in Spain during the 20<sup>th</sup> century. This traditional approach was characterised by building large infrastructures (some 400 dams during Franco's period) and increasing water supply, as well as by a perception of water policy as a sectoral and centralised matter. In contrast, the NWC movement emphasised the need to manage water demand and allocation and thus adapt uses and users to existing water availability, e.g. through pricing and reuse, integration of water into landscape planning and promoting the engagement of stakeholders in the management of river basin resources. After a successful campaign by pressure groups working in concert at local, national but also at European level, the National Water Plan was finally withdrawn in 2004. This has been widely understood as the beginning of a transition in water policy not only in Spain but also elsewhere.

### What was done?

The study examined the New Water Culture movement within the transition theory framework (see pages 40 – 42) and in particular, the role played by culture and/or by biophysical constraints in triggering transitional changes in the water domain. The focus was on the review of a selection of available assessment tools and methods and the development of both a World Cellular (WC) model and a new Integrated Sustainability Framework (ISF) to represent and support niche sustainability developments within the domain of water in a social learning mode. The



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Monument to the People in Defence of the Ebro

World Cellular Model and Framework aimed not only to represent the complexity of social-ecological relationships of the Ebro river basin, but also to contribute to the empowerment of relevant pro-sustainability agents.

The WC model and ISF are structured in a way that provides a total system perspective of water uses and of the stocks and flows of water using a linked agent-based model. Policy trade-offs and alternatives are assessed with regard to the impacts (both positive and negative) on other agents rather than between abstract economic, social and economic domains. So the main focus is not so much on defining 'what' the problem is, but rather on 'who' has agency and responsibility for its resolution. The WC framework also includes a user-friendly interface in the form of a 'water game' to facilitate a structured dialogue among stakeholders and to support reflexive learning. The game contributes to the understanding of agents' motives and to help stakeholders to

become aware of the social-ecological constraints of their actions and wants. It also contributes to agent engagement and to the reframing of perspectives on the unsustainability problem; it can be used in the experimenting stage of the ISA cycle to simulate situations that cannot be carried out in real time. In short, the WC Model and the game aim at empowering sustainability-related agents, illustrating differences in the agents' competences, and uncovering issues regarding the fairness in power and resource distribution (see page 30 for a screen-shot of the game).

#### What ISA can contribute to current European water policies

ISA provides a structured framework that permits the integration of different sources of knowledge in the process of framing, envisioning and elucidating socially and ecologically robust strategies, pathways and system interventions toward sustainability regime transformation. ISA could potentially be very useful for European

water policies, which are not yet taking a fully integrated systems-based approach to sustainability for various reasons. The use of ISA within the water policy domain can provide agents and policy makers with a new vision, derived from a structured process for regime change. It can also contribute to the setting of voluntary limits to social-ecological growth and to redirecting patterns of development, and, thus, to increasing the long-term opportunities for improving water security and human welfare. ISA provides opportunities to make coherent narratives that integrate multiple domains, scales, problems, languages, and institutional arrangements. The application of ISA creates opportunities to help coordinate the actions of different agents to achieve patterns of development that are compatible with the long-term changes occurring in the social-ecological system as a whole. In the context of the Ebro river basin and other river basins in Spain, a transition was underway before the start of the MATISSE project. However, by deploying ISA it becomes



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easier to identify the current status of the transition process and provide appropriate support that may empower relevant agents and catalyse the process. Importantly, there are clear opportunities for ISA to play similar roles in identifying, structuring and supporting other niche developments in the domain of water management.

### What was learned?

An important insight from the first iteration of the ISA cycle was a vision from stakeholders of sustainability as a situation in which relevant agents continuously learn to collaborate for the common good. This does not mean that all actors have the same set of goals and interests that drive their actions, or that all of them share the same world-views and ideas about the future. Rather, it means that the different perspectives of the future are not necessarily completely at odds with each other and that a certain degree of complementary and positive synergies can be found among them.

However, the second ISA iteration showed that in order to achieve substantive sustainability outcomes, collaboration among agents is not enough; agents also need to transform their practices. This result was obtained mainly by the application of an extended version of the game called the Water Transition Play. Transforming agents' behaviours and actions depends on building strategies that can appeal to the various agents and on building trust between agents. This is not something that can be achieved easily or in a short time frame, but depends on securing agents' commitment to the search process.

Our application of ISA for the case of water has allowed us to better identify the key elements that drive current unsustainability in the domain of water and beyond, not only from an 'expert' perspective but, more importantly, from the perspective of the 'people of the context'. The ISA deliberative processes can open up new debates and improve the capacities for greater awareness

and control over the negative consequences of different policy alternatives and measures. Our procedure contributed to the identification of policy options. However, further research is needed to understand and assess to what extent these options can be implemented in the policy process.

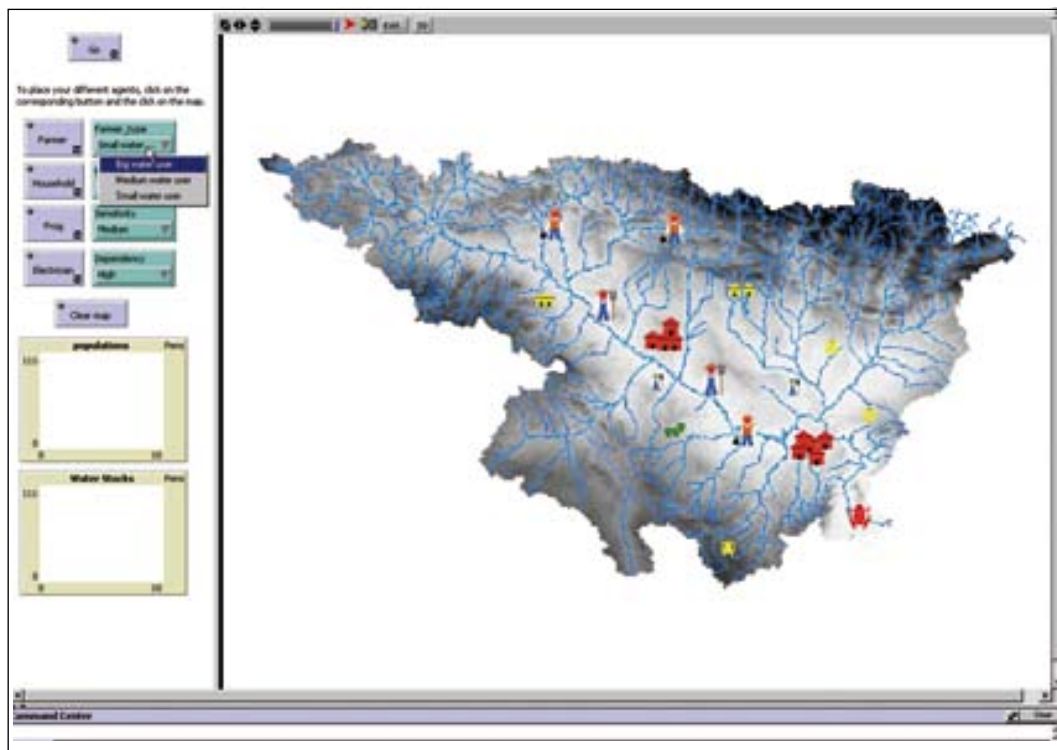
ISA water models and tools can help to improve the understanding of the total system under consideration thus to assess the conditions under which transitions occur. However, the roles of ISA models and tools go beyond simple systems' representation and include agent empowerment for transformation. In order to achieve this, and to support transitions, current models should provide easy interfaces, be more malleable and interactive, and better integrate the social dynamics and stakeholder concerns. The water case study has explored this new modelling approach with the development of the World Cellular Framework and gaming interface.



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This case study also showed that language is a key element in overcoming the persistent problems of unsustainability, and in particular there is a need to develop a shared language among experts from different specialisms and among stakeholders that is able to bridge the divides between economics, natural sciences, and ethics. Hence, together with the World Cellular Model, we developed and implemented an original conceptual framework to support the making of a sustainability narrative. We developed and used a framework called SEIC (Structure and institutions - Energy and resources - Information and knowledge - system Change) to integrate languages from different sources and backgrounds. Key elements included in this conceptual and linguistic framework concern time and scale, which we use as cross-cutting themes. We aimed at developing a relational framework to explore sustainability and its meaning, which could be made operational as an easy-to-use model able to support the development of systemic narratives about transition processes.

In this project, ISA has been performed as a basic research experiment. But at the same time, the integration of different sources of knowledge has broadened our understanding of the essential components of sustainable development and has enormously enriched our assessment and depiction of the whole system dynamics. We conclude that a precondition for the successful use of ISA is a common agreement by those engaged in



Screenshot of the Water Transition Play

policy making that strategic structural change is needed. The success of ISA for a certain project does depend less on the environmental or sustainability problems encountered and more on the sincere willingness of agents to engage in a process of system transformation.

**Further Reading:**

Tàbara, J.D. and Ilhan, A.(2007). Culture as Trigger for Sustainability Transition in the Water Domain. The case of the Spanish Water Policy and the Ebro River Basin MATISSE Working Paper 10. Available at: [www.matisse-project.net](http://www.matisse-project.net)

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