



# Modelling the links between irrigation, ecosystem services and rural development in pursuit of social legitimacy: Results from a territorial analysis of the Neste System (Hautes-Pyrénées, France)



Sandra Ricart <sup>a,\*</sup>, Sylvie Clarimont <sup>b</sup>

<sup>a</sup> Department of Geography, Faculty of Arts, University of Girona, Plaça Ferrater Mora 1, 17071 Girona, Spain

<sup>b</sup> Laboratoire SET, Institut Claude Laugénie, Université de Pau et des Pays de l'Adour, Avenue du Doyen Poplawski, 64000 Pau, France

## ARTICLE INFO

### Article history:

Received 23 March 2015  
Received in revised form  
11 August 2015  
Accepted 27 September 2015  
Available online xxx

### Keywords:

Irrigation  
Competing water uses  
Civil society  
Governance  
Territorial irrigation management approach  
Neste system

## ABSTRACT

Concerns about water scarcity and management have focused attention on the relationship between agriculture and other competing water uses. This research aims to evaluate the perceptions of and preferences for irrigation use and management in a rural area, and it does so through an analysis of stakeholder attitudes in a large irrigation system in Southern France: the Neste System. The stakeholder analysis approach and the governance model approach are applied in combination with a new form of graphical representation to evaluate the conflicting points of view between stakeholder's profiles, which are called TIMA. Results revealed that there are heterogeneities between the preferences of stakeholder groups regarding water resources management, agricultural practices, and irrigation challenges. Qualitative and graphical results highlight the competing topics, the stakeholder relationships and the ability to secure permanent agreements by promoting participatory development and good governance. These results can be used by the relevant authorities to customize their interventions, knowing beforehand and in a well-structured form which are the different stakeholders' priorities. In this way, more effective avenues of communication can be established in the decision-making processes regarding irrigation challenges.

© 2015 Elsevier Ltd. All rights reserved.

## 1. Introduction

With available resources diminishing in quantity and quality and increases in the range of uses in competing sectors, water use has become a critical issue worldwide (Falloon and Betts, 2010; Antunes et al., 2011). The need to find new ways of sharing available water between competing water users (including the environment) has increased over the last decades, especially in semi-arid and arid regions (Rootes, 2007; Bjornlund et al., 2014). As the largest user of fresh water, agriculture sits at the interface between the environment and society, and any improvements in water management need to take into account its multifunctional nature (McGuire et al., 2015; Pahl-Wostl et al., 2007; Knox et al., 2012; Martins et al., 2013). Multifunctionality refers to the diversity of functions, benefits, and services provided by agriculture that go beyond the production of food, fibre, fuel, and industrial products

(Marshall, 2004; Holmes, 2006; Fernald et al., 2007; Morgan et al., 2010). Related to irrigation, recent studies have documented the incidental but important ecosystem and societal benefits of irrigation systems. Some of these ecological functions associated with irrigation practices are: riparian vegetation and habitats along the canals; groundwater recharge from canals and irrigation-application seepage; increased aquifer storage resulting from this recharge; and the re-emergence of groundwater in springs and wetlands (Lawrence, 2006; Wiener et al., 2008; Özerol et al., 2012). In contrast, the separation of water governance from land-use planning in rural areas has contributed to numerous challenges, including contamination of soil and groundwater, over-allocation of water, or landscape fragmentation (Reed, 2008; Baker et al., 2014). These conversions affect water distribution and use, threaten community-managed irrigation systems, and could potentially affect hydro-ecological processes that are dependent on canal-based irrigation systems (Folke et al., 2005; Young et al., 2006; Turrall et al., 2010).

Historically, water resources and agriculture professionals sought to solve challenges raised by water use in agriculture by

\* Corresponding author.

E-mail addresses: [sandra.ricart@udg.edu](mailto:sandra.ricart@udg.edu) (S. Ricart), [sylvie.clarimont@univ-pau.fr](mailto:sylvie.clarimont@univ-pau.fr) (S. Clarimont).

using a technocratic approach (Levin, 2006; Luyet et al., 2012). Nowadays, the environmental debate has become more holistic, calling for active stakeholder participation (De Marchi et al., 2000; Gleick, 2000; Olsson et al., 2004; Allan, 2005; Pahl-Wostl et al., 2008) and an integrative approach to water resources management that takes into account the complex relationships between technologies, institutions, cultures and practices (Jeffrey and Gearey, 2006; Giordano and Shah, 2014). This shift from a technocratic “top-down” to a more integrated “bottom-up” approach is also based on the increased awareness that today’s water problems are complex, requiring integrated solutions and a legitimate planning process (Broderick, 2005; Tippett et al., 2005; Margerum, 2007). In this sense, different stakeholders have different interests and different normative frameworks related to ideas of water efficiency, land use, environmental externalities, or social legitimacy in decision-making processes (Harrison and Qureshi, 2000; Boelens and Vos, 2012). Consequently, this attention to the territorial aspects has led most studies on natural resources management to conclude that if initiatives incorporate a wide range of stakeholder interests, attitudes and opinions, they are more likely to succeed than those where participation is less relevant (Carr and Halvorsen, 2001; Bidwell and Ryan, 2006; Carlsson and Sandstrom, 2008; Reed et al., 2009; Cuéllar-Padilla and Calle-Collado, 2011; Lienert et al., 2013; Jonas et al., 2014). In this sense, inquiries into irrigation developments frequently address sets of engineering issues, while omitting any detailed discussion of the institutional, social, cultural and economic contexts in which irrigation takes place (Collins et al., 2001). Consequently, involving civil society in irrigation management decisions leads to resolving conflicts, greater public commitment and reduced distrust between the government agencies and the diversity of stakeholders (Ananda and Herath, 2003; Hophmayer-Tokich and Krozer, 2008; Bohnet, 2014).

Parallel to the interest in water, land, and environmental management, there has been growing recognition of the territory as an integrative matrix of common goods with different uses and demands. The notion of territory is very often taken into account without a precise, explicit and stable definition of the concept (Elden, 2010). According to Sánchez-Zamora et al. (2014), the concept has always evolved concomitantly with the identification, description and definition of the elements contained in a territory. Consequently, the definition of this concept has been associated with the presence of resources (natural, environmental or cultural) and agents (institutions, organizations, stakeholders) (Pecqueur, 2004). For example, Ghiotti (2007) defines the territories of water “as a social and political construction that goes beyond the traditional watershed management approach”. In addition, the concept of rural territorial dynamics refers to the processes of development in the socioeconomic structure, institutional framework and environmental capital of rural territories, as well as in the changes that accompany the effects of development when governance is promoted (Häkli, 2001; Morrison, 2014). These interactions and transformations give rise to processes of change in the socioeconomic structure, as well as in the human, cultural and environmental capital that define the territory, its demands in competition, and its management approach.

This paper examines the territorial character of irrigation management through the prism of stakeholder attitudes toward the Neste System, and it will compare and discuss their priorities and discourses around irrigation management and governance. In particular, it strives to understand how the rural community and irrigators’ attitudes (in the context of an increasingly post-productivist farming regime) affect rural development along with water and environmental management. Further, we hope to better understand how civil society assesses irrigation practices and how it can be involved in the management of public and private services,

to name just one example of a more participative and holistic management of the commons. Finally, we want to identify the potential for establishing an agreement between competing interests and conflicting points of view about rural development. In this work, some previous techniques of qualitative analysis (the stakeholder analysis and governance model approaches) are combined with a new type of graphical representation based on a multi-stakeholder platform. This allows us to form the bases of the Territorial Irrigation Management Analysis (TIMA) as a tool to assess the relationships between competing water uses. We believe that this paper could stimulate greater discussion about including the qualitative approach, social learning, and an ‘attitude change’ in the development of irrigation practices and policies, which in turn would help stimulate rural development.

## 2. The study area

The management of irrigation in the Midi-Pyrénées region (southwest France) is inseparable from the implementation of the Neste irrigation canal in 1862 (Ricart and Clarimont, 2013). It is diverted by gravity along 29 km, with the water flowing from the River Neste (14 m<sup>3</sup>/s). As part of the Neste System’s management, it incorporates a hydraulic system of seventeen rivers that are artificially replenished and widely interconnected (Villocel et al., 2010). The Neste irrigation canal has become central to the construction process of rural heritage, socio-economic identity, and the promotion of environmental services (Table 1) (Petit, 2004). It has an clear initial mission: improve the productive capacity of agriculture in the Lannemezan Valley (Fig. 1). However, with the passage of time, the irrigation canal has had to respond to multifunctionality: energy production, ecological flow, recreational activities, and environmental services. In parallel, droughts have occurred on the Adour-Garonne River Basin over the last decade, leading to an increase in the debate (if not outright conflict) between the competing water demands, particularly in terms of how to prioritize water uses and formulate their management model.

## 3. Data collection and methods

In order to provide new knowledge from complementary data sources and analytical tools, we used a case study methodology to collect rich qualitative data on the experiences of the involved stakeholders in the Neste System.

### 3.1. Key stakeholders

Grimble and Wellard (1997) define the term stakeholder as ‘any group of people –organised or not– who share a common interest or stake in a particular issue or system’. It is a difficult task to select representative stakeholder groups from within the community. There is a broad range of stakeholder groups who are involved in irrigation, and our study classifies them according to public and private services, the rural community, and civil society. The pre-selection of the stakeholder groups was carried out through an extensive literature review and an expert group meeting (Bryson, 2004; Bodin and Crona, 2009; Gallego-Ayala and Juárez, 2014). In order to first gauge stakeholders’ perceptions and attitudes about irrigation management and governance, a small (n = 11) but representative sample of stakeholders involved in the Neste System management were identified and organized according to four interest groups, with the goal of including the potential multiple points of view and interests that cover the whole stakeholder spectrum regarding Neste System management (Bryson, 2004; Dewulf et al., 2005): public services (public administration and service delegation), private services (land and water consortiums or

Download English Version:

<https://daneshyari.com/en/article/6545506>

Download Persian Version:

<https://daneshyari.com/article/6545506>

[Daneshyari.com](https://daneshyari.com)