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Improving the management of water multi-functionality through stakeholder involvement in decision-making processes

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ABSTRACT

This paper maps the interaction between irrigation multi-functionality and decision-making processes in order to improve governance in Southern European hydro-social systems. Two approaches, the stakeholder analysis approach and the governance model approach, are applied in accordance with the territorial dimension of geographical analysis in order to evaluate the conflicting points of view between stakeholder profiles. The obtained results can be used by the relevant authorities to customize their interventions, allowing them to know beforehand which are the different stakeholder priorities and in this way establishing more effective avenues of communication.

1. Introduction

If the 20th century was the era of administrative management, then the 21st century may be the era of collaborative management (Schusler et al., 2003; Koontz and Thomas, 2006). This seems particularly true for complex issues like water, where decision-making processes have increasingly shifted from public hierarchies to multisectorial, transversal, and holistic collaborative arrangements (Lynam et al., 2007; Neef and Neubert, 2011; Bijani and Hayati, 2015). For management problems, especially in the field of natural resources, the current trend is to develop integrated policies that are sustainable in the long term and that take into account all the factors and actors related to and involved in the resource use (Pahl-Wostl et al., 2008; Carmona et al., 2013; Singh, 2014). Water is different from other natural resources in that it is not only used for numerous economic and technical purposes, but it also has cultural, social and symbolic dimensions (Bjornlund et al., 2014). According to this, solutions to water problems depend not only on water availability or scarcity (Mildner et al., 2011; Ringler et al., 2013; Gunasekara, 2014), but also on many other factors, among which are: the processes through which water is managed (Gearey and Jeffrey, 2006; Barbosa and Brusca, 2015; Franzén et al., 2015); competence and capacities at the institutional level (Bidwell and Ryan, 2006; Forouzani et al., 2013); prevailing socio-political conditions and environmental requirements that affect water planning, development and management processes and practices (Baskaran et al., 2013; Page and Bellotti, 2015); appropriateness and implementation statuses of the legal and regulatory frameworks (Hering et al., 2010; Iglesias et al., 2011); water concessions and costs (Dono et al., 2012); availability of investment funds as and when needed (De Fraiture et al., 2010; Levidow et al., 2014); climatic, social and environmental conditions of the regions or countries concerned (Martins et al., 2013); levels of available and usable technology (Boelens and Vos, 2012; Chartzoulakis and Bertaki, 2015); national, regional and international attitudes and perceptions (Jonsson, 2005; Carr et al., 2011); and modes of governance including issues like political interference or transparency (Lockwood et al., 2010; Gupta et al., 2013).

The water and agriculture nexus, which is often embedded in seemingly endless ecological, social and political interactions across multiple temporal and spatial scales, is context-dependent, socially constructed and technically uncertain (Carr et al., 2012; Burnham et al., 2014; Peltonen-Sainio et al., 2015). Water scarcity and land management concerns have focused attention on irrigation, the largest water-using sector worldwide, which is widely considered a low-value, wasteful and "inefficient" water use, particularly in arid regions with competing and sharing water demands (Biswas, 2008; Giannoccaro et al., 2013). Sharing water resources is not something societies tend to do well, because management of water resources is a particularly challenging and difficult task, where the complexities arising from the functioning of hydrological cycles and biological systems are combined with the multiple perspectives, needs, values and concerns associated with

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the use of water for human related purposes (Perry et al., 2009; Allan, 2012; Gunasekara, 2014). Some of these considerations are shaped by multiple legitimate perspectives and problem definitions, which are based on a wide range of stakeholder values, worldviews and interests in increasingly diverse societies (Jonsson, 2005; Pahl-Wostl et al., 2011; Heydari, 2014). Accordingly, irrigation and irrigation management have become increasingly debated in terms of their social, economic, environmental and cultural relevance (Wriedt et al., 2009; Özerol et al., 2012; Baskaran et al., 2013). Accordingly, the concept of multi-functional irrigated systems has gained prominence for stimulating policy framework as a way to integrate consumptive and non-consumptive water demands from the agricultural sector (Delli, 2004; Brummel and Nelson, 2014).

In recent years, political ecologists and anthropologists developed an approach to water that recognises it as a socio-natural hybrid (Schneider, 2015). This understanding of water is closely linked to the idea of a hydro-social cycle, which likewise takes into account the inseparability of social and physical aspects of water (Linton and Budds, 2014). In parallel, integrated management and participation in water resource policies have gained increasing momentum over the last decades (Araújo et al., 2015). Stakeholder engagement and participation is increasingly recognized as a critical aspect of sustainable water resources management (Butler and Adamowski, 2015). Participation approaches may bring together a range of stakeholders with different interests and enable them to identify their own positions and those of others, leading to a deeper understanding of the issues (Jacobs and Buijs, 2011). Moreover, if the stakeholders are not involved at all in defining and evaluating alternatives, then the outcome could be controversial and the solutions proposed could generate strong opposition, making those solutions unfeasible (Murgue et al., 2015). However, this positive association of participation with resource management has not prevented there being many disadvantages and limitations to the process, and debate continues over its value and capacity to promote integrated management (Muro and Jeffrey, 2008). The rhetoric can be used as a rationale for reducing government culpability, and participatory decision-making can be vulnerable to manipulation by powerful interest groups or even cause harm to some stakeholders (Sändstrom, 2009; Voinov and Brown, 2008).

In this context of complexity and uncertainty, the notion of government as the central ruler that advances the stated goals of environmental and territorial policies through hierarchical coordination, top-down decisions and scientific expertise is being complemented by the more fluid notion of Integrated Water Resources Management (IWRM) and the water governance approach (McDonnell, 2008). IWRM is defined as a framework for planning, organizing and operating water systems in order to unify and balance the relevant views and goals of stakeholders (Giordano et al., 2007; Grigg, 2008). This means that it is necessary to incorporate not only public actors but also private interests and the demands of civil society in watershed decision-making processes, especially if there is competition for natural resources and a potential impact on ecosystem services (Hernández-Mora et al., 2015). IWRM principles affirm that economic, environmental and social systems are linked and changed through reciprocal interactions (Rault and Jeffrey, 2008). The concept of water governance has emerged as a key issue within the IWRM framework. Its implementation incorporates the political, social economic and administrative systems that are in place for developing and managing water resources as well as delivering water services to the different levels of society (Paneque et al., 2006; Abernethy, 2010; Gillet et al., 2014). Both concepts have to confront the challenges related to an increasing complexity, diversity, and permanent change. Furthermore, they must do so in such a way that: 1) no single actor has the resources or knowledge to respond alone to the complexity of current problems and/or opportunities; and 2) the central government can capitalize on opportunities to solve these problems without interacting with other stakeholders (Folke, 2007). But governance is not synonymous with government (Pahl-Wostl et al., 2011; Kuzdas et al., 2015). It is instead a complex process that considers multilevel participation beyond the state, where decision-making includes not only public institutions, but also the private sector, sectoral interests and civil society (Tortajada, 2010; Kuzdas and Wiek, 2014). Around the year 2000, 'Water governance' became a popular term within international debates about 'sustainable development', 'integrated water resources management', and the 'global water crisis'. All of these terms have tended to become vague generalities through careless overuse (Muro and Jeffrey, 2012). According to Bauer (2015), 'governance' is considered the generic process of governing, while 'government' refers to specific formal institutions that govern. For Kemp et al. (2005), 'governance' refers to the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders have their say. Governance is thus a broader category than government and includes a variety of social and political actors in addition to the state. Governance is inherently political (Lautze et al., 2011). The term new governance (Howlett and Rayner, 2006) has emerged to describe a mode of governing that shows a preference for collaborative approaches among government and nongovernment actors from the private sector and civil society.

Social learning is increasingly acknowledged as a valuable output of building models from governance and from the perspective of participatory natural resource management (Morales and Harris, 2014). It refers to the capacity of a social network to communicate, learn from past behaviour, and perform collective action (Sharp and Adua, 2009; Lafreniere et al., 2013). The potential role of social learning for natural resource management is to promote and intensify their application by establishing participatory learning platforms, where individuals can meet, interact, learn collaboratively and take collective decisions (Gallego-Ayala and Juízo, 2014). The multi-faceted nature of socio-natural systems has prompted many writers (both theorists and practitioners) to call for wider use of social learning models to address the complexity of sustainable natural resource management and promote desirable behavioural change (Keeler et al., 2015). More recently, social learning has specifically been proposed as a means to support participative planning in water and river basin management (Pahl-Wostl, 2002).

The primary aims of this paper are: to analyse the attitudes of the key stakeholders involved in multi-functional irrigation systems based on their discourses; and to assess the relationships between competing water-land-environment demands. More specifically, this paper aims to contribute to understanding how the rural community and irrigators' attitudes affect rural development and the management of water and the environment, all within a context of an increasingly post-productivist farming regime. Further, we analyse the public-private partnership that focuses on the promotion and development of irrigated infrastructure, and we consider how the concept of 'general interest' is increasingly of interest to the common goods management debate. Finally, we provide more information about how civil society assesses irrigation systems and how social demands can be involved in its management. In addition, this paper analyses the potential role of combining qualitative and quantitative analysis, and it does so by means of the *stakeholder analysis approach* and the *governance model approach*, particularly as applied to studying topics with a geographical profile, like irrigation. Applying these approaches to three case studies from Southern Europe will be useful for putting

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