METHODS

The importance of social learning and culture for sustainable water management

Claudia Pahl-Wostl[a],*, David Tàbara[b], Rene Bouwen[c], Marc Craps[c], Art Dewulf[c], Erik Mostert[d], Dagmar Ridder[a], Tharsi Taillieu[c]

[a]*Institute of Environmental Systems Research, University of Osnabrück, Barbarastrasse 12, 49076 Osnabrück, Germany*
[b]*IEST, Autonomous University of Barcelona, Spain*
[c]*Centre for Organizational and Personnel Psychology, Katholieke Universiteit, Leuven, Belgium*
[d]*RBA Centre, Delft University of Technology, The Netherlands*

A R T I C L E   I N F O

A B S T R A C T

Currently water resources management is undergoing a major paradigm shift. Water resources management has a strong engineering tradition based on controlling environmental problems with technical solutions. The management of risks relied on the ability to predict extremes and limit their impact with technical means such as dikes, dams and reservoirs. In this paradigm, belief systems, human attitudes and collective behaviours are perceived as external boundary conditions and not as integral part of management. However, the situation has started to change dramatically. Over the past years, integrated water resources management has become the reigning paradigm. The importance of governance and cultural adaptation has become a major issue of concern. At the same time, there is a paucity of adequate scientific concepts that would allow addressing these issues. This paper introduces a concept for social learning developed in the European project HarmoniCOP and discusses its implications for the cultural and institutional context of water resources management. It aims to contribute to the new paradigm of integrated resource management by discussing the importance of processes of culture and social learning for environmental resources management, in general, and water resources management, in particular.

1. Introduction

Contemporary problems in water resources management and resources management in general, are characterized by increasing complexity. Uncertainties due to climate and global change and changing socio-economic conditions provide new challenges that cannot be tackled within the established management paradigm which relies on a command and control approach. In this paradigm, regulatory authorities implement technical (often end-of-pipe) solutions to narrowly defined environmental problems based on expert advice. Presently there is a growing awareness, in particular in developed countries, of the need for integrated approaches that simultaneously take a whole range of trade-offs into account and that involve stakeholders in the whole management process.

The need for a paradigm shift in water management has been advocated by a couple of voices over the last decade (Cortner and Moote, 1994; Ward, 1995; Gleick, 2000; Pahl-Wostl, 2002, 2007a). Although they focus on different topics of

water management, they clearly agree on some elements of the new paradigm:

- participatory management and collaborative decision making,
- increased integration of issues and sectors,
- management of problem sources not effects,
- decentralized and more flexible management approaches,
- more attention to human behaviour by "soft" measures,
- include environment explicitly in management goals,
- open and shared information sources (including linking science and decision making),
- iterative learning cycles.

Most recent analyses emphasize that effective governance based on principles of equity, efficiency and diverse knowledge integration is as important for dealing with water resource management problems as technological solutions (GWP-TEC, 2000, 2004). Culture is advocated as crucial to understand barriers to the adoption of technologies and new management strategies and a successful exchange of experience between developed and developing countries. This reflects a shift in emphasis from focusing on "hard" technology based centralized approaches to a "soft" path in water management embracing participatory approaches and delivering diverse water services matched to the user's needs (Gleick, 2003; Pahl-Wostl, 2007a; SIWI, 2005).

As defined by the dialogue on effective water governance (Roger and Hall, 2002), water governance refers to the range of political, social, economic and administrative systems that are in place to regulate the development and management of water resources and the provisions of water services at different levels of society. One important aspect of governance is the role of "institutions": the formal and informal rules that provide the framework for the behaviour of human beings. Formal institutions include laws and regulations, formal organizational structures and formal procedures. Informal institutions refer to socially shared rules and norms that have developed in social practice. A strong interdependence and synergies between formal and informal institutions is an emergent feature of more collaborative governance styles and is particularly important for understanding institutional change and transitions towards more adaptive water management regimes (Pahl-Wostl, 2002, 2007a; Pahl-Wostl et al., 2005). Participatory processes may be formalized, but more importantly they play a key role in informal institutional settings and are often nuclei for social learning and institutional change.

Another key concept in the emerging new management paradigm is social learning. Social learning in river basin management refers to the capacity of different authorities, experts, interest groups and the public to manage their river basins effectively. Effective river basin management requires collective action and the resolution of conflicts. This in turn requires that people learn about their interdependence and differences and learn to deal with them constructively. Social learning refers to this learning process and to the resulting increased management capacity. Social learning implies a change in governance style towards more collaboration and a different role of information as a means to support communication instead of just providing expert advice. This reflects

the insight that management cannot be based on optimizing in a predictable environment but requires many instances of learning in a fast changing world.

The new water management paradigm currently under consideration also reflects a new understanding of the relationship between human activities and the environment. One could argue that these changes in perception can be interpreted as signs for a more fundamental cultural change regarding the awareness of complexity and leadership styles (Pahl-Wostl, 2007b).

The argument of the paper is organized around the following two questions addressing the relationship between culture and social learning:

- How do cultural differences influence social learning?
- How can social learning lead to a transformation of culture?

To address these two questions, the paper is structured as follows. A concept for social learning and a conceptualization for culture are introduced. These concepts lay the foundation *for exploring the relationship between culture and social learning – the influence of culture on social learning and vice versa –* using examples from river basin management.

2.   Social learning

The notion of social learning has been used in quite different contexts. The work of Bandura (1971) on social learning refers to individual learning based on observation of others and their social interactions within a group e.g. through imitation of role models. It assumes an iterative feedback between the learners and their environment, the learner changing the environment, and these changes affecting the learner.

Because of its focus on the individual, Bandura's work is of limited value for understanding resources management. In the EU project HarmoniCOP (http://www.harmonicop.info) we adopted a broader concept for social learning in the context of river basin management influenced by authors like Wenger (1998). Social learning in this concept refers to the growing capacity of social entities to perform common tasks related with a river basin. It refers to both the learning process and to its outcome. In the following we summarize the key elements of the social learning concept which is elaborated in more detail in Pahl-Wostl et al. (2007).

Of major interest in this respect is the concept of "communities of practice" developed by Wenger (1998) emphasizing learning as participation in groups of people who engage in a process of collective learning in a shared domain of human endeavour. Such interactions are influenced by and may change social structure. At the same time the individual gains experience situated in the context of the group. Such learning processes confirm and shape the identity of the individual in its social surroundings. They confirm and change social practice and the associated interpretation of the environment. Communities of practice require a clear objective and they continuously redefine themselves by processes of participation (e.g. membership, acting) and reification (e.g. forms, documents, instruments). Communities of practice develop an identity of their own that is distinct from the individuals participating in them.