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The role of knowledge and research in facilitating social learning among stakeholders in natural resources management in the French Atlantic coastal wetlands

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ARTICLE INFO

Published on line 30 May 2007

Keywords:
Natural resource management
Social learning
Intervention research
Wetlands

ABSTRACT

Environmental policy development increasingly refers to procedural approaches where local organisational structures are set up to initiate social interactions, to establish common working methods and to formulate collective agreements. In a context of complexity and uncertainty regarding environmental issues at stake, deliberations are mostly about managing interdependencies, i.e., building agreements and implementing changes so as to reconstruct the links between natural, technical and social phenomena. We see these deliberations as situations where social learning occurs; as an iterative process of knowledge co-production (i.e., of 'knowing') among stakeholders brought into interaction. Our research aims at better understanding these processes in the context of French Atlantic coastal wetlands where multi-stakeholder platforms for decision-making have become the dominant process for implementing natural resources management policies. Our studies focus on the challenge of managing the production and application of knowledge in social settings, in which scientists themselves come to play a role. They show how scientific knowledge can acquire heuristic value when used in the context of intervention research, as well as revealing some of the ethical dilemmas this may pose for the role of researcher.

1. Introduction

Stakeholder involvement in decision-making has become an established form of policy implementation at European level since the Aarhus convention (1998). In the field of environmental policy, it has given rise to a mix of policies based on either a substantive or a procedural rationality. The former are typically produced by centralized authorities who define goals and means. The latter emphasize local organisational structures set up to initiate social interactions while maintaining them within pre-defined boundaries, and to establish common working methods and the formulation of collective agreements (Lascoume and Le Bourhis, 1998). In the latter case, citizens and stakeholders are not only informed but are

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1462-9011/$ – see front matter
doi:10.1016/j.envsci.2007.01.012

also asked to interact on various platforms at different levels, from local to national. Stakeholder involvement can be seen as a means to convince people of the relevance of policies, thereby increasing their social acceptability. It can also be seen as an approach essential to making problems manageable by allowing people to act in an uncertain world (Callon et al., 2001).

Some authors see in the procedural approach the emergence of a 'technical democracy' (Callon, 1998), where deliberative processes allow stakeholders to compare their differing points of view, interests or understanding of reality regarding the management of biological and technical objects such as water, biodiversity and human uses of natural resources. Our research aims at better understanding the processes at work in participative approaches and the factors that can enable or constrain these processes and their outcomes. It is based on a premise of SLIM ''that it is very useful to view sustainability as an emergent property of stakeholder interaction, and not as a technical property of the ecosystem'' (Ison et al., 2004, p. 6). The goal of our research on deliberative processes is twofold:

- Develop a conceptual framework allowing us to better understand how interacting people in 'confused' situations characterised by inherent uncertainty gain some degree of understanding of interdependencies, make decisions and take action.
- Gain a better understanding of the role that scientific knowledge and researchers can play in these processes of change through an 'intervention research' approach (Hatchuel, 2000).

We begin by sketching the context and the conceptual, theoretical and methodological basis of our work. We then report our findings from a comparison of two case studies, each related to the sustainable management of the French Atlantic coastal wetlands. Finally, we discuss our findings with regard to their implications for environmental policy development and management of natural resources.

2. Context of the Atlantic coastal wetlands case study

2.1. *The need for water control structures human perceptions and practices*

Marshlands along the French Atlantic coast cover 260,000 hectares of ancient marine gulfs that were silted up with marine and fluvial sediments. Their main geo-physical characteristics are:

- Saline and hydromorphic clay soils (between 40 and 60% clay).
- Low level and flat topography, resulting in specific constraints to water management.
- Wet meadow micro-topography, creating a gradient of hydromorphic conditions at field scale resulting in high plant and animal species diversity.
- Hydrological interdependencies: between marshland, watershed and sea, between fields and canal network and between surface and groundwater.

The human uses of Atlantic marshlands are dependent upon good water control to prevent flooding and allow agricultural production. In the early 1960s water control was described by a state engineer in the following terms: ''the constant adaptation of water availability to productive needs requires extensive works and structures, i.e., dykes to protect the marshes against sea water, dams at river deltas to avoid flooding by muddy sea tides, maintenance of river beds and ditches, new canals to drain and irrigate the land, dams to store fresh water and avoid flooding, flood barriers to adjust the surface water levels to the agricultural enterprises that are to be promoted'' (Talureau, 1965, p. 57). A deep human 'footprint' resulting from successive management plans and activities (Table 1) structures the wetlands' 'life milieu' and its functioning. Stakeholders in marshland development have developed human-centred perceptions that can be split into three categories, thus revealing the key relationships that people have established with the resource:

- Those who perceive the marshes as a constraint to human development that has to be reduced. Water managers, farmers, landowners and municipal mayors comprise most of this group.
- Those who recognize that the marshlands offer specific characteristics favouring some human activities over others. Extensive livestock farmers, shellfish farmers, fishermen and some hunters share this point of view.
- Those who consider the marshes as a 'sanctuary' for nature and who want to control, reduce or even exclude human activities that affect the natural functioning of these areas. This view primarily concerns nature conservationists.

2.2. *The engineering era, 1960s onwards*

In 1955 a French decree on agricultural modernisation was locally translated into a water development scheme. This set off the domination by a powerful coalition which perceived the marshes as potentially highly productive areas, if hydrological constraints could be reduced. A significant increase in civil engineering capacity improved the ability of water boards to control water flow, and resulted in an overall decrease in surface water levels and the duration of flooding. At the same time, government agricultural agencies at national, regional and local level, in concert with professional organisations, agreed to improve agricultural production by the transformation of wet meadows into drained croplands. Researchers provided guidelines for water table control in hydromorphic clay soils (Damour et al., 1972; Collas, 1985) and for cropping techniques and crop-plant behaviour (Capillon and Pellerin, 1984; Pons, 1997) under such specific conditions. The consequence was a rapid change of landscapes between 1970 and 1992, leading to significant loss of grassland.

This development model resulted from a highly coordinated multi-level decision-making process, ranging from local to European levels and operating within a single-sector mindset. Crops, and livestock relying on maize silage rather