The importance of processes of social learning for transboundary water management - Perspectives from the HarmoniCOP project

PAHL-WOSTL, C.*, Bouwen, R, Craps,M., Maurel, P., Mostert, E., Ridder,D., Thallieu, T.
*Institute of Environmental Systems Research, pahl@usf.uni-osnabrueck.de, Albrechtstrasse 28, University of Osnabrück, Germany.

KeyWords: Participatory water management, social learning, institutional change, IC-tools

The role of social learning in resource management

It is widely claimed that a new type of collaborative governance is required for integrated water resources management which has as main principles:

- Water users must be involved in the governance of the resource.
- Policy planning and implementation must be based on integrated solutions.

Most recent analyses and workshop reports emphasize that effective governance is more important to deal with water resource management problems than technological solutions. Participatory approaches are advocated as an improvement aspect of integrated water management regimes.

The role of participatory processes are an important characteristic of the governance system. 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 provisions of water services at different levels of society. One important aspect of governance is the role of institutions that can be defined as the formal and informal rules governing the behavior of human beings. Formal institutions include laws and regulations (such as the European Water Framework Directive), formal organisational structures and formal procedures. Informal institutions refer to the rules and norms that are followed and develop in practice. The interaction between formal and informal institutions is an emergent feature of more collaborative governance styles and this interaction is particularly important for transboundary settings.

Information management is a good indicator on governance styles in transboundary settings (Langaas and Timmerman, 2003). Nilsson reported on the study on information management in transboundary water regimes in Europe (Nilsson, 2003; Nilsson and Langaas, 2003). The study provides evidence that a technical/scientific paradigm appears to dominate in transboundary water regimes. Information needs are mainly determined by the commissions own needs and not by the requirements to involve stakeholders. This is confirmed by the results from the GIS working group on the implementation of the WFD (GIS Working Group, 2002). The type of information used refers mainly to state of the environment and impacts with little attention to response options and pressures. This applies ot both the type of information used and the way how information is used. Nilsson and Langaas conclude that current information management approaches do not meet the requirements of integrated water resources management. New information needs should be defined taking into account the needs of stakeholders and other interest groups and more participatory fora and mechanisms should be developed. This insight is not limited to transboundary water regimes but refers to a more general need for a shift in paradigm in water resources management (Pahl-Wostl, 2002b).
Such a change in paradigm will require instances of social learning of the river basin management authority and the interest groups. Social learning is both a means and a goal. The governance style will change towards more collaborative governance and the role of information and IC tools will reflect the new need to support communication instead of providing expert advice only.

Water governance faces a couple of challenges.

- The tradition of water resources management is shaped by technological approaches.
- Institutional structure is fragmented.
- Biophysical units and administrative boundaries do not match.

The latter points are often referred to as institutional fit and interplay. Institutional fit refers to the degree of matching of bio-physical scales with administrative boundaries. Given the fact that river basins do not match administrative Interplay refers to the interaction between institutions where one makes the distinction between horizontal referring to different sectors such as water management, regional planning or agriculture and vertical referring to scales such as local, regional, national.

The problem of institutional fit and interplay are especially pronounced in transboundary settings. Institutional change and learning are required. It is claimed here that it will involve in particular the development of informal institutions.

A concept for social learning and institutional change

The HarmoniCOP (Harmonizing COllaborative Planning) started October 2001. Its main objective is to increase the understanding of participatory river basin management in Europe. It aims to generate practically useful information about and improve the scientific base of social learning and the role of IC-tools in river basin management and support the implementation of the public participation provisions of the Water Framework Directive.

The nature of the processes of social learning will determine the types of decisions to be taken into consideration. Many intricate problems in water management require that social groups start to communicate and processes of social learning and collaborative governance will help to overcome institutional fragmentation (horizontal and vertical) characterizing wide areas of water management.

The notion of social learning has been used in quite different meanings to refer to processes of learning and change of individuals and social systems. In the influential work of Bandura (1977) 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 learner and their environment, the learner changing the environment, and these changes affecting the learner.

This approach is too narrow to embrace all the learning processes of relevance in resources management. The HarmoniCOP project adopted a broader definition:

“Social learning refers to the growing capacity of social entities to perform common tasks related with a river basin. It is both a process and an outcome. One has also to know the context in which it takes place and how the outcomes of social learning may affect this context. The mutual tuning by the actors between the social and the physical system, is the essence of the process. In this IC-tools may play a major role.”

Social learning involves:
- new individual and social cognitions,
- new (changed) individual and collective attitudes
- new (improved) skills
- new social roles of individual actors or groups
- joint action.

Of major interest in this respect is the concept of “communities of practice” developed by Wenger (1998) emphasizing learning as participation. Individuals engage in actions and interactions that have to be embedded in culture and history. Such interactions are influenced by and may change social structure. At the same time the individual gains experience situated in a context. 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.

Such a broad understanding of social learning that is rooted in the more interpretative strands of the social sciences characterizes also the approach adopted by the HarmoniCOP (Harmonizing COllaborative Planning\(^1\)) project. Figure 1 represents the framework for social learning developed in the HarmoniCOP project to account for learning processes in water resources management (Craps et al, 2003).

![Figure 1 Conceptual framework for social learning for resources management.](image)

This framework embeds the process of social learning for resources management in a context of governance structure and natural environment. It emphasizes that in the process of resource management, social involvement (e.g. the generation of social capital, the development of new social practices) is as important as content management (e.g. the development and communication of knowledge about the state of a water resource, use models to predict the effects of measures to achieve a good ecological state of a river). The outcomes of the management process are not only technical qualities such as an improved state of the environment but also relational qualities such as an improved capability of the actors in a basin to solve conflicts and come to cooperative agreements. The outcomes feed back into change and mutual tuning of governance structure and the state of the natural environment. Social learning is an iterative and ongoing process that comprises several loops and enhances the flexibility of the socio-ecological system and its ability to respond to change. Relational practices are shared task-centred practices among different actors that allow to interact in a reciprocal way and/or reflect the interactions among the actors. We

\(^1\) More information at www.harmonicop.info
expect better technical solutions as the relational quality of interactions among the actors increases, and a better quality of jointly reached solutions will stimulate more social learning dynamics.

Social learning in water resources management involves learning processes of the different groups at and across different scales. In particular in transboundary catchments dialogue and the resolution of conflicts require that people recognize their differences and learn to deal with them constructively. It is important that the process is linked to a concrete process. That raises the crucial issue of information design, storage and retrieval and communication between stakeholders (Rool 2004, Woodhill 2004).

Over the past year a concept for social learning adapted to the specific requirements of RBM and a framework for categorizing different IC-tools (Maurel et al 2003) were developed to investigate the role of social learning and IC-Tools in different phases of river basin management Craps et Maurel 2003).

Such tools may have different roles, depending on their intrinsic properties, on the way they are designed, on their combination with group animation techniques, on the sharing of informational resources (tools, data, skills, support...) among the participants :

Support social learning:
- Elaborate and provide well balanced information for the debate in ways that are relevant for the stakeholders and that allows collective learning ;
- Help to elicit perspectives and behaviours of stakeholders, to make them explicit to the others.
- Facilitate relational practices – e.g. participative mapping, role playing games, behavioral simulations ;

Support decision making processes – stepwise fashion to take into account uncertainties, keeping the memory of these decision making processes and make it accessible and understandable to non-participants.

Investigations of the role of information have provided evidence for the still prevailing expert/technocratic culture in transboundary water management. They diagnosed an urgent need for change. This suggests that it is crucial to combine relational aspects with information, to make more explicit the relational functions of IC-tools and their usability (i.e. to fit a given purpose in a given context). The relational functions depend not only on the intrinsic properties of the tool but also on the way it is designed and used within group animation techniques. To be able to fulfil these functions, an IC-tool should have all or part of the properties of what (Star et al 1989) call boundary objects and (Vinck et al 1995) call intermediary objects.

The correct design and use of IC-tools will be more tricky in transboundary situation for several reasons : differences in term of culture, language, “real world representations”, scientific and technical background and knowledge, information needs, data availability and characteristics (e.g. data national policies, data model, spatial and temporal scale, data collection protocol, copyrights, ...), difficulties to make information systems interoperable, lack of common indicators, ...

---

2 Within HarmoniCOP project, an IC-tool is defined as “a material artefact, device or software, that can be seen and/or touched, and which is used in a participatory process to facilitate Social Learning. It supports interaction between stakeholders through two-way communication processes”.
Providing factual knowledge alone is not sufficient. The relational component is key to promote social learning where actors change their role. Given the nature of the process this signals as well potential problems. Some actors may lose power and others may gain. Change in responsibilities may occur as well.

**The specific situation of transboundary catchments**

Integrated management of transboundary river basins poses major challenges to the integration of different administrative, legal, cultural, institutional and economic traditions. International regimes have been mainly characterized by formal institutional arrangements. However, the development of management plans requires that actors involved communicate and cooperate at different scales. Uncertainties require institutions that can adapt and learn from prior experience.

Regarding opportunities for social learning in transboundary catchments one should emphasize two scales:

- within international commissions with representatives from different nations
- stakeholder processes in trans-boundary basins

The specific challenges for trans-boundary catchments arise from the differences characterizing the countries sharing a river basins. These differences comprise:

- Legal and regulatory frameworks (formal institutions)
- Languages.
- Economic conditions.
- Political history and antecedents with “public participation”.
- Stakeholder organizations.

Given such differences informal institutions and processes of social learning seem to gain even more in importance. However, also such processes are influenced by differences in different national cultures that partly find their manifestation in the structural differences listed above. Hofstede (2003) developed a framework with different dimensions to characterize cultural differences. The dimensions summarized in Table 1 can be operationalized and quantified. They refer to differences in risk aversion, individualism, hierarchies and governance by formal rules that are all highly relevant for understanding governance styles and transition processes towards more collaborative governance.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Dimensions of cultural differences according to Hofstede (2001).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Distance Index (PDI)</strong></td>
<td>focuses on the degree of equality, or inequality, between people in the country's society. A High Power Distance ranking indicates that inequalities of power and wealth have been allowed to grow within the society. These societies are more likely to follow a caste system that does not allow significant upward mobility of its citizens. A Low Power Distance ranking indicates the society de-emphasizes the differences between citizen's power and wealth. In these societies equality and opportunity for everyone is stressed.</td>
</tr>
<tr>
<td><strong>Individualism (IDV)</strong></td>
<td>focuses on the degree the society reinforces individual or collective achievement and interpersonal relationships. A High Individualism ranking indicates that individuality and individual rights are paramount within the society. Individuals in these societies may tend to form a larger number of looser relationships. A Low Individualism ranking typifies societies of a more collectivist nature with close ties between individuals. These cultures reinforce...</td>
</tr>
</tbody>
</table>
extended families and collectives where everyone takes responsibility for fellow members of their group.

**Masculinity (MAS)** focuses on the degree the society reinforces, or does not reinforce, the traditional masculine work role model of male achievement, control, and power. A High Masculinity ranking indicates the country experiences a high degree of gender differentiation. In these cultures, males dominate a significant portion of the society and power structure, with females being controlled by male domination. A Low Masculinity ranking indicates the country has a low level of differentiation and discrimination between genders. In these cultures, females are treated equally to males in all aspects of the society.

**Uncertainty Avoidance Index (UAI)** focuses on the level of tolerance for uncertainty and ambiguity within the society - i.e. unstructured situations. A High Uncertainty Avoidance ranking indicates the country has a low tolerance for uncertainty and ambiguity. This creates a rule-oriented society that institutes laws, rules, regulations, and controls in order to reduce the amount of uncertainty. A Low Uncertainty Avoidance ranking indicates the country has less concern about ambiguity and uncertainty and has more tolerance for a variety of opinions. This is reflected in a society that is less rule-oriented, more readily accepts change, and takes more and greater risks.

**Long-Term Orientation (LTO)** focuses on the degree the society embraces, or does not embrace, long-term devotion to traditional, forward thinking values. High Long-Term Orientation ranking indicates the country prescribes to the values of long-term commitments and respect for tradition. This is thought to support a strong work ethic where long-term rewards are expected as a result of today's hard work. However, business may take longer to develop in this society, particularly for an "outsider". A Low Long-Term Orientation ranking indicates the country does not reinforce the concept of long-term, traditional orientation. In this culture, change can occur more rapidly as long-term traditions and commitments do not become impediments to change.

Hofstede’s classification has been applied to different countries. Figure 1 lists results from an analysis quantifying four of the cultural indices for some European countries:

<table>
<thead>
<tr>
<th></th>
<th>Power Distance Index</th>
<th>Individualism</th>
<th>Masculinity</th>
<th>Uncertainty Avoidance Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>35</td>
<td>67</td>
<td>66</td>
<td>65</td>
</tr>
<tr>
<td>Hungary</td>
<td>45</td>
<td>55</td>
<td>70</td>
<td>83</td>
</tr>
<tr>
<td>Netherlands</td>
<td>38</td>
<td>80</td>
<td>14</td>
<td>53</td>
</tr>
<tr>
<td>Italy</td>
<td>50</td>
<td>76</td>
<td>70</td>
<td>75</td>
</tr>
<tr>
<td>Belgium</td>
<td>65</td>
<td>75</td>
<td>54</td>
<td>94</td>
</tr>
<tr>
<td>France</td>
<td>68</td>
<td>71</td>
<td>43</td>
<td>86</td>
</tr>
<tr>
<td>Spain</td>
<td>57</td>
<td>51</td>
<td>42</td>
<td>86</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>35</td>
<td>89</td>
<td>66</td>
<td>35</td>
</tr>
<tr>
<td>Switzerland</td>
<td>34</td>
<td>68</td>
<td>70</td>
<td>58</td>
</tr>
</tbody>
</table>

One can note pronounced differences that can be expected to affect governance styles and attitudes in transboundary commissions and supra-national negotiations. A couple of empirical investigations seem to confirm that Hofstede’s dimensions correlate with observed cross-cultural differences in behaviour. The preference for equitable versus equal allocation of rewards could for example be linked to Hofstede’s power distance index in a review of numerous studies on that theme (Fischer and Smith, 2003). Elfenbein and Namady (2003) analyzed numerous investigations of the relationship between Hofstede’s dimensions and the ability to recognize emotions. They showed that empirical evidence for linking cultural profiles with absolute levels of emotion recognition accuracy was weak. However, they found
an increase in the cultural distance between different groups to be associated with greater discrepancy in the degree of emotion recognition accuracy in inter-group communication.

It is arguable if cultural differences are mainly determined by national identities. Professional groups in different countries may share more similarities than representatives from the same country but from very different social groups. There exists hardly any empirical evidence on these issues. Given their importance for understanding collaborative governance, more research should be performed in this direction.

At the level of trans-boundary commissions, negotiation processes between countries and in processes of stakeholder participation of organized groups individuals act in their role as representatives of an interest group, a governance system. Hence one can expect that in this role cultural differences at the level of the group are more important than inter-individual variations and that national identities play a major role.

The HarmoniCOP project is currently performing case study in river basins at different geographical scales in nine different European countries. Some of the case studies address the trans-boundary scale. We expect more insights from these results on the importance of national and cultural differences as potential impediments to successful transboundary resource regimes and the role of processes of social learning to overcome them.

Implementation of the WFD and the challenge of adaptive water mangement

The implementation of the European Water Framework Directive is a particular challenge in transboundary basins. During a recent conference on the implementation of the WFD (organized by the Concerted Action HarmoniCA) arguments were raised that standards for implementation should be more flexible and that the most urgent and important need are instruments for an improved dialogue.

A case study reported for example problems in using the WATECO implementation guidelines (derived from the implementation group for economic issues) in a joint Hungarian – Romanian Integrated Testing of WFD Guidance Documents in the Szamos/Somes river basin. The guidelines prescribe in detail the steps to be undertaken. However, they offer little support in dealing with different interpretations of the guidelines in different countries sharing a transboundary basin.

Steps required for testing:

- Definition of water uses and water services
- Methodology for trend analysis
- Methodology for cost recovery
- Scales (necessity of harmonisation)

Some conclusions from the first phase:

- Most tasks are highly interconnected
- The prescribed methodology can be interpreted in several ways and the interpretation may be determined by the availability of data, previous experience or cultural differences in setting priorities.
- Baseline scenario building needs more methodological elaboration (e.g how to involve stakeholders at different scales) and harmonisation within the Danube river basin

The guidance did not offer support for dealing with transboundary issues and the need for dialogue. The development of baseline scenarios should include stakeholder participation in
an early stage. One major conclusion of the discussions during the HarmoniCA conference were the perceived need for approaches and tools that support dialogue (see also www.harmoni-ca.info for a summarizing report).

This recent discussion supports again the argument stating the importance of formal and informal institutions – the latter must develop a shared practice to become independent of individual membership. Emergent institutions are more flexible than formal settings. Social learning will promote the development of informal institutions that are required to cope with challenges posed by the WFD. They are a prerequisite for a paradigm shift towards adaptive water management.

Adaptive management can more generally be defined as a systematic process for continually improving management policies and practices by learning from the outcomes of implemented management strategies. As Bormann (1994) defined it “Adaptive management is learning to manage by managing to learn”. In its most effective form it employs management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed. Adaptive water management has another target - its goal is to increase the adaptive capacity of the system. It is aimed at integrated system design. The problem to be tackled is to increase the ability of the whole system to respond to change rather than reacting to undesirable impacts of change. Hence it is a pro-active management style that may replace the current management style in water management not only in transboundary basins.

Acknowledgements
The ideas reported in this paper profited from the lively and intensive discussions in the HarmoniCOP project. The concepts developed are based on the work of many project participants. More details can be found in the project reports.

The HarmoniCOP project is supported by the European Commission under the fifth framework programme (contract No. EVKT1-CT-2002-00120).

References


