

Interactive Management of International River basins; Experiences in Northern America and Western Europe

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Abstract. This paper deals with the experiences of international water commissions with a more interactive way in dealing with society and water system. The first experiences with co-operation in international institutions between water managers already started many centuries ago. For the river Rhine it formally began in 1885 with agreements on navigation and fishery, for the border waters of the United States and Mexico with a border treaty in 1889 and for the boundary waters of the United States and Canada the first international agreement was signed in 1909. In recent years, an intensification of co-operation can be observed, which brings new challenges for water managers. The ecosystem approach from the International Joint Commission and the integrated starting point as well as the participation of stakeholders in the work of the International Commission on the Protection of the Rhine, can be seen as promising examples of the modernisation of international water management. They are part of a development to "international interactive water management".

1 Introduction

In this paper some new developments in water management are described. They can be seen as examples of a new concept, in which interaction is the key element. Interaction of water managers takes place with the society on the one hand, and with the water systems on the other hand.

In both fields some interesting innovations are taking place. Firstly, the participation of citizens and Non Governmental Organisations (NGOs) in the decision-making process. This is an example of the interactive relation that water managers have with the society.

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Secondly, the projects to restore natural dynamics of river systems. Here the water managers interact with the water system. The elements fit in a broader development that, step by step, leads to international river basin management.

The innovations can be found in the recent work of three commissions with a very long history of transboundary water management. The oldest international institutions for water management can be found in Western Europe and northern America. In the Rhine basin international co-ordination started with agreements on navigation between Holland and Germany in 1755. It resulted in 1885 in the establishment of the current Central Commission for shipping on the Rhine. In the same year the Rhine countries agreed on an international Salmon Commission, which in 1950 was revitalised as the International Commission on the Protection of the river Rhine (ICPR). First this International Rhine Commission had to co-ordinate the huge problems with pollution. Later, more and more elements of river system management were added. Recently the commission became the central institution for the whole river system.

In northern America international water management started in 1889 with a joint commission for the settlement of the border between Mexico and the United States. The International Boundary and Water Commission (IBWC) still has to deal with the more than 2000 kilometres of boundary waters. Twenty years later, in 1909, the comparable International Joint Commission (IJC) was established, for the immense boundary waters of the United States and Canada.

2 Interactive water management

Nowadays, the integrated approach is the central theme in water management. All elements that play a role in water management are interrelated and are part of a system. This implies that all adequate decisions on water issues are made within the context of the system they are part of. The integrated approach is also implied in interactive

management, because also this it is primary directed at "systems". The major improvement is the mutual working method, based on sensitivity for the demands that the two interacting systems put forward.

The water manager has to deal with the society in the first place. Here the underlying causes for disturbances of the water system can be found. A large variety of actors influence the environment in many different ways. Interaction between these societal actors and the water managers is the only way internalisation of sustainable behaviour can be realised. The interactions consist of information exchange with the general public and involvement of stakeholders in the decision-making process. This involvement is more than informing actors in society. It offers mechanisms to the public to contribute to decision-making.

Secondly, the interactive water manager has to deal with the water system: the whole of interrelated physical, chemical and biological components. An interactive approach requires the continuous monitoring of a wide range of system parameters. This enables the water manager to know at every requested moment the conditions of its policy object. The monitoring must operate on the level of the water system in order to understand developments in connected areas. Taking the water system as a starting point means that new operations can never be large-scale everlasting solutions. If only small process changes are generated, corrections have less severe consequences. This means that the interactive management style is based on incremental changes, fed by feedback from the system.

The relation between the water managers and their policy subjects can be characterised as a "dialogue" (Saeijs, 1995). In current international water management of Western Europe and northern America some promising examples of this dialogue can be found. With respect to the interaction with the society, participation of citizens and NGOs in decision-making is initiated. With respect to the interaction with the river system, it resulted in restoration projects of the natural dynamics of the water level.

3 Public participation

Structural participation of the public in the decision-making process started with a protection program for the Great American Lakes. The first projects were executed by the Great Lakes Commission (GLC), established in 1950. This commission was originally a group of five US states and some relevant federal agencies. The water quality of the lakes had become unacceptable by the late sixties. Especially the condition of Lake Erie was extremely bad. Because of the lack of oxygen it is said that the lake was dead in the sixties. In 1969 the Cuyahoga River, a tributary that enters Lake Erie from Cleveland, even caught fire. It

resulted in huge public pressure leading to an agreement on environmental protection of the Great Lakes (GLC, 1999).

In the Great Lakes Water Quality Agreement of 1972, the IJC was mentioned as the co-ordinating institution for the stimulation of public initiatives. Since then many hearings and workshops were organised in order to find solutions for the degraded state of this largest fresh water system on earth. It resulted in the establishment of Citizen Advisory Groups and a practice in which for every new project stakeholders are asked to bring in their view. Furthermore, the influence of the Great Lakes Science Advisory Board should be mentioned. This independent board gives its view on developments in the Great Lakes area on a regular basis.

The participation of stakeholders becomes more and more important in the work of the Rhine Commission too. In 1998 nine international NGOs got an official accreditation for the plenary sessions of the Rhine Commission. The NGOs represent all kinds of special interests. But the Rhine Commission wants more public participation. Citizens should be involved directly in policy formulation, and discussions started about the way the democratic dimension can be strengthened.

Public participation can effectively be stimulated with financial instruments. This can be illustrated with an experiment in the border area of Mexico and the USA. In 1993 a new organisation has been established, the Border Environment Co-operation Commission (BECC, 1999). It is based on an, until recently, unknown level of transparency in the relations between Mexico and the USA. BECC is a result of the trade agreement NAFTA and uses the funds of the North American Development Bank (NADBank). The primary task of the BECC-commission is to check projects on their financial and environmental viability. Proposals are initiated by citizens and communities on both sides of the border.

In order to be financed, the projects have to meet strict criteria, especially on aspects such as environmental analyses, financial basis and public involvement. In several cases also the initiatives for projects are subsidised. The procedure is unique with respect to public participation, grassroot initiatives, transparency and internet-based discussion groups. It brings Millich & Varady (1998: 11) to the conclusion that the experiment in international co-operation is the most promising agreement to date.

Positive results of the procedure of BECC are:

- strengthening of the capacity and involvement of the local institutions and people;
- improvement of the environment;
- increase in financial capacity; and
- co-operation of different types of organisations on both sides of the border.

When the experiences with BECC remain positive, it could be recommended to introduce a comparable multinational

facility in other river basins. But then such a fund should be connected to a river basin organisation, as the most suitable institution. This means for example that BECC-like funds should be connected to reliable institutions like the Rhine Commission, the IJC and even the IBWC. It is a direct consequence of the water system approach that river basin organisations also have a task in financial matters. As these organisations consider the whole range of aspects that are relevant in the water system, they are the most suitable for setting priorities in spending the available amount of money.

In the interaction with the public, one instrument has considerable potential: the internet. This new medium facilitates perfectly open decision-making. It allows direct publication of all relevant information. Experiences with the sites of the commissions mentioned (BECC (1999), IJC (1999), IBWC (1999) and ICPR (1999)) are generally quite positive. The question remains why both IJC and IBWC do not integrate the sites of their national sections. Furthermore, the absence of a site of the Mexican IBWC delegation can be considered as a mistake. Although the site of the Rhine Commission covers all countries, the information that is offered is quite limited. This site should at least be upgraded. In any case, it should contain all official documents the commission has published.

4 Restoration of natural river systems

With respect to interaction with the water system in an international context, the first structural co-operation was agreed in 1978. In the Great Lakes Water Quality Agreement, the restoration and maintenance of the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem was the final goal. In the agreement the water system was explicitly chosen as the starting point for water management. This so-called ecosystem approach (Allen et al., 1992; Coape-Arnold et al., 1995), has been worked out in guidelines by the ECE (1993).

The World Bank (Easter et al. 1993) adopted the approach in 1993: (...) watersheds must be managed as valuable natural resources to meet multiple uses rather than just inputs to specific sector activities. It also seeks to balance the need for holistic, ecosystem-based approaches for sustainable management of water resources (...) (Olem & Duda, 1994: 470). First the concept was focused on water quality issues. But later the awareness developed that a certain dynamics in water level has a crucial meaning for many organisms.

Within the United States an important experiment took place with a river that has been changed considerably by many large dams: the Colorado. With the "Adaptive Management Program" of the Colorado (ARSO, 1999)

some of the natural fluctuations in water level are

reintroduced. In March 1996 the Glen Canyon dam was open for one week in which around 2.700 cubic meters of water were released from Lake Powell (Arizona). The experiment cost around one and a half million dollar, due to a decrease in power supply. Not all costs are counted in monetary units, for example biologists had to remove approximately 1.300 specimen of the rare Kanak Amber snail from a canyon wall in order to prevent extinction. The ecological aim of the artificial flood was in the first place focused on the restoration of the undep parts of the river, in which aquatic organisms like fish and frogs could breed. Furthermore, it was hoped that sandy beaches would return and thresholds in the river would decrease.

The physical results of the experiment already were realised in two days, so probably a potential new flood could take considerably less time and water. Furthermore, the populations of fish species recovered quite fast. An in-depth evaluation has to give the necessary information for possible new artificial floods.

In the Rhine basin floods came for a completely other reason in the centre of attention. The grounds along the lower parts of the river increasingly are at risk of flooding. In February 1995, the danger was so realistic that in the Netherlands about 200.000 people (and 700.000 pigs, 700.000 cows and a million chickens) had to be evacuated. The high water levels were caused by the total of, mostly small, man made physical changes in the river system. Everywhere little parts are taken from the high water river bed. In this way the space for the river in periods with much precipitation decreases considerably. It leads to extremely high peak water levels. Comparable with the Mississippi floods of 1993, the process is worsened by the removal of nature areas that originally absorbed rainfall like a sponge and the construction of drainage systems that makes the water flow faster into the river. Also the covering of the land with hard materials, like roads and buildings, had these results. Together, the processes make the discharge peaks larger and larger.

However, the recent awareness of these facts and the near disasters with floods already resulted in a broad range of plans for "returning land to the river". When these retention areas are combined with nature development, it can influence the restoration of the river system in a very positive way. Other examples of "eco-restoration" can be found in an increase of projects of rehabilitation of the habitat of migrating fish, like salmon. Since 1987 the Rhine commission works on projects that in 1999 already had a value of more than 15 million Europe (ICPR, 1999). In the mean time, the first results can be observed: salmon was spawning in the River Sieg, a relatively natural tributary at the lower parts of the German Rhine.

The IJC too works on restoring the declining salmon stock, especially on the West Coast of the continent (amongst others the Columbia River). In other rivers, similar

activities are being realised. For example with respect to the River Allier, a tributary to the French River Loire, dams and weirs have been removed in order to let fish pass.

5 Development to interactive water management

Public participation and restoration projects are promising examples of the modernisation of international water management. They are part of a general development in the way water is dealt with (Van Ast, 1998). Presently, the general goal is integrated water management. But in some places, elements of a new concept come to the surface. In this interactive water management, transboundary river systems fall under the competence of international organisations.

As long as political considerations like sovereignty have decisive influence on water management, international institutions can only be realised in an incremental way. The evolution can take place in three main steps: first co-ordination, then co-operation and later supra-national river basin management.

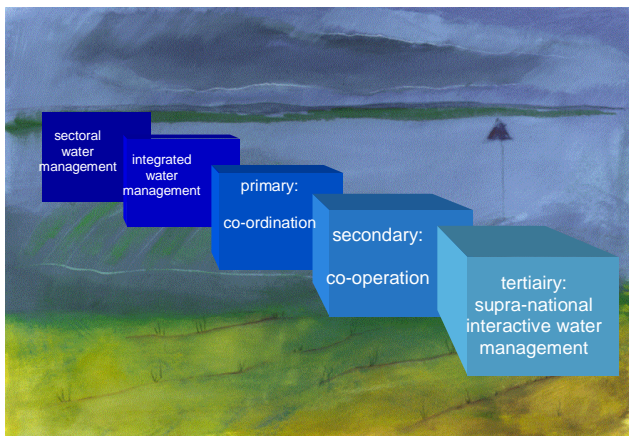


Fig.1. The development of the concept of water management

In all three phases, the integration of all organisations with sector responsibilities in one commission is a condition for a well-balanced water management. This organisation should play a role in the whole water system, including aspects of land use as far as essential for the management of water systems.

Nowadays, the Rhine countries, together with NGOs are heading for a comprehensive river system plan that integrates most of the functions the Rhine system offers. Nevertheless, even in the Rhine area, with more and more interdependent economies, a supra-national water commission will probably not be reached within a short time. But the step of co-operation on the level of the water system, centralised in one international commission, can certainly be realised in the near future. Ultimately, it can lead to international commissions that have competence's

enabling them to manage water systems shared by more than one political entity. In my view this is the only way to keep the road open to the sustainable development of transboundary water systems.

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