NeWater

NEWATER DELIVERABLE 1.3.2

ADAPTIVE WATER MANAGEMENT IN TRANSBOUNDARY CONTEXTS

Common Research Agenda

Report of the NeWater project -
New Approaches to Adaptive Water Management under Uncertainty

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1 Transboundary water management in NeWater

1.1 Background

The challenge of integrated water resources management is even more complex in the context of transboundary water bodies, as management paradigms of different riparian states need to be co-ordinated and aligned to allow for adaptive approaches to water management at the international scale. Such challenges occur in hundreds of rivers and aquifers throughout the world. In the UNECE region alone there are more than 150 transboundary rivers and 50 international lakes. Due to the complex governance structure in transboundary basins their capacity for reacting in a flexible way to changing boundary conditions, such as for example environmental degradation and water scarcity, is in many cases limited.

In the past, the inadequate management of transboundary water bodies, following a lack of co-ordination among riparian states and the apparent mismatch of natural conditions and institutional settings, has resulted in conflicts of interest and even dispute over shared watercourses.

In an effort to pre-empt and prevent such situations and to provide mechanisms for proactive conflict resolution, several governance structures have emerged in transboundary river basins over the past years. In fact, the co-operation of riparian states on the sustainable use of water resources is increasingly considered a main element in strengthening regional collaboration among states.

In this context, the 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes has provided a guiding legal framework for regional co-operation on shared water resources. Among other objectives, the Convention primarily advocates overcoming the traditional, fragmented approach to water management and taking on more holistic strategies. The Convention serves as a reference for existing agreements and provides guidance for the design of new agreements.

Co-operative approaches currently in place in international river basins comprise numerous bilateral and multilateral agreements. Joint bodies, in many cases commissions or other appropriate institutional arrangements, constitute the core structure of such governance systems. Among the tasks of the joint bodies are:

- the identification and inventory of pollution sources,
- the setting-up of joint monitoring programmes,
- assessing the effectiveness of control programmes,
- facilitating the exchange of information on the best available technology and other best practice,
- the implementation of environmental impact assessments.

In fulfilling these tasks, the joint bodies are faced with the challenges of integrating and considering not only differing national approaches to basin management in terms of the legal and regulatory frameworks, but also different economic and cultural situations and traditions.

Apart from the establishment of formal organisational structures for the management of transboundary bodies, other co-ordination models, relying on voluntary negotiations among already existing institutions in the river basins, are being discussed as well. These informal efforts strive to fulfil tasks similar to those outlined before. It should be noted that, in reality, hybrid forms of these two countervailing regime types are the most probable regime type.

The success of a transboundary regime depends on the sustained integrative capacity of its respective set-up. This capacity is determined among other factors by the elements discussed below. These could possibly also serve as a basis for developing effective indicators to assess a regime's flexibility with respect to changing boundary conditions.

- Inclusiveness of the regime with respect to all relevant stakeholder groups as a key component to allow for social learning of all actors; an important means to cope with changing boundary conditions and uncertainty.
- Clear allocation of tasks and responsibilities among the different parties of the regime.
- Adoption of effective mechanisms for the collection and sharing of information as a prerogative for sound decision-making and participation.

1.2 The NeWater Approach

In response to the above mentioned challenges in transboundary water management the NeWater project is focussing on two main research areas: the structure and constellation of institutions in the water governance of transboundary basins, and the role of information management in such regimes.

These foci were selected in order to break down the overwhelming complexity of transboundary water governance by looking at the issues from two different - but also directly related - aspects of transboundary river basin management.

Focus on institutions – guiding questions

The potential for different ensembles of institutions to promote adaptive capacity, learning, and flexible management across borders is determined by several factors, including the capacity and structure of the institutions within a country, the interaction and power play across borders (diplomacy/negotiations) as well as the role of international agreements, both as informal understandings and formal conventions (ratified or not).

A special emphasis will be laid on the following questions:

- What are the most relevant national and international water laws and policies and what is their influence on transboundary water management? Is the transboundary institutional setting coherent with the national organisational framework in water management? How can informal co-operation and formal agreements and treaties be balanced in a transboundary water management system?
- What are the main governmental and non-governmental actors; what are their main goals, strategies and capacities; how do they interact?
- What is the influence of different national or organisational cultures? Does the current transboundary regime reflect the negotiation culture in the respective region?
- To what extent are stakeholders and the public involved in transboundary river basin management?
- To what extent do management systems deal with uncertainty/change and the decreasing predictability of extreme events?
- What regime changes have occurred in the past, how were these effected? What is the nature and speed of these changes?

Focus on information – guiding questions

The potential to stimulate adaptive capacity and management through greater and easier information access and communication between stakeholders, both across and within borders, is a key research area.

The guiding questions in this context are:

- What kind of information is needed by what actor for the management of transboundary resources? Is there a strategy to fulfil these needs? What are the spatial and temporal scales of information considered?
- Who collects, produces and interprets information? How is uncertainty dealt with?
- Is information exchanged? Between which actors?
- How is information used in decision-making processes? By which actors?

- What were drivers for (un)successful examples of information exchange (e.g. budget, flood/drought etc.)?
- Are data shared for developing transboundary management plans?

2 State of progress

2.1 Overall Activities

According to the description of work of WP 1.3, its aim is to provide an overview of the "state-of-the-art" research on the influences of information and institutional contexts on transboundary water management. This knowledge will be applied to examine how changes in institutional settings or information transfer can lead to more adaptive strategies for management in specific transboundary case study areas. Transboundary issues cannot be separated from national issues; in order to cover this aspect WP 1.3 will work closely with WP 1.2 for analyses of national institutional/governance issues.

The content of Deliverable 1.3.1 is strongly related to that of Deliverable 1.2.1, in which the current state of governance and the institutional arrangements are analysed for South Africa (Orange basin), Uzbekistan (Amudarya basin) and Germany, Switzerland and the Netherlands (Rhine basin). Furthermore, the planned activities of the RBA Centre in the transboundary Niederrhein case study are based on WP1.2 (participation) as well as WP1.3 (transboundary regimes).

Overall activities in the frame of WP 1.3 have the following technical purposes:

- the integration of other components of NeWater research into the research activities of WP 1.3 and vice versa,
- the dissemination of WP 1.3 activities and results,
- assuring an effective project management and research work.

The following activities were undertaken during the first ten months:

WP 1.3 reserach

- Activity plan for WP 1.3 of February 2005,
- Preparation of case study reports on transboundary regimes,
- Preparation of a synthesis report,
- Preparation of a common research agenda for WP 1.3.

Interaction with case study basins

- Design of a baseline template on information needs, as well as a concept sketch for the involvement in the Amudarya and Orange basins in February 2005,
- Design of a general flyer on Ecologic's involvement in NeWater,
- Design of flyers on transboundary issues for Orange and the Amudarya,
- Interactions with case study WPs to obtain relevant information for the basin reports,
- Participation in the several case study meetings to elicit information, clarify research needs and to prepare the common research agenda.
    - Amudarya case study meeting in Bonn 7 April 2005 with presentation of concept paper,
    - Participation in a Tisza Basin meeting in Sarospatak in Hungary, 21 – 23 May 2005,
    - Participation in several meetings on the Rhine case.

2.2 NeWater Deliverable 1.3.1: understanding the current situation

The following section is a summary of Deliverable 1.3.1, state-of-the-art report on transboundary river basin management.

2.2.1 Introduction

Traditionally, River Basin Management (RBM) has been treated as a technical issue, which can be addressed through prediction and control. In practice however, RBM is faced with complex issues that are characterised by uncertainty and change. Because current knowledge is unlikely to be sufficient in the future, RBM needs to be adaptable to new information and changing circumstances.

Adaptive management aims at active learning of all stakeholders and continually improving management strategies by learning from the outcomes of implemented policies (Pahl-Wostl 2004). This approach might require changes in the management regime, consisting of law, policy, formal and informal actor networks and interactions between these elements (see Figure 1). Improving for example public participation and information management is essential in the development of a learning and adapting RBM regime.

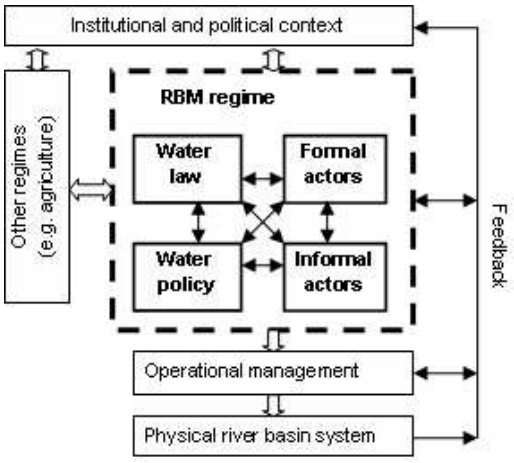

Figure 1: River basin management regime

2.2.2 Research methodology

The management regimes of the seven NeWater river basins have been analysed:

- the Amudarya, Elbe, Guadiana, Rhine and Tisza basin in Europe;
- the Orange and Nile basin in Africa; and
- the Amudarya basin in Central Asia.

The regimes were compared in order to answer the following research question:

To what extent do current regimes and information management systems support adaptive management?

This question has been elaborated in an evaluative framework, which has been applied to the selected basins. The framework consists of criteria concerning formal and informal actor networks, the legal framework, policy development and implementation, information management and financial aspects.

2.2.3 Results

The extent to which the regimes and information management in the studied basins support adaptive management varies significantly (see Figure 2). The Rhine and Elbe regimes currently offer the largest potential for adaptive management. The regimes in the Amudarya and Nile basins, as well the Orange, Guadiana and Tisza regimes, are not ready for adaptive management yet. Although a first step has been made in developing institutions for transboundary co-operation, the intended structures have not been fully implemented yet. As long as the political setting is not ready for changes, there will be little political will for the development of transboundary water laws and policies.

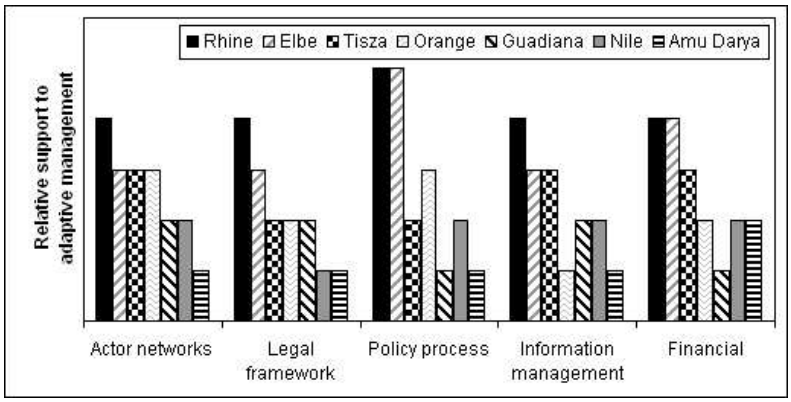

Figure 2: Comparison of support transboundary regimes to adaptive management

The analysis also offers some insight in the order of development of an adaptive regime. It can be hypothesized that co-operation across administrative boundaries and joint information production are often part of the early phases of the transition. Somewhere in the middle of the transition an appropriate legal framework and financing system may be developed, policies may be developed and implemented, and a broad communication, including public participation, may be established. Requirements for adaptive management that are still hardly existent in any of the studied basins are adaptable legislation, cross-sectoral co-operation, interdisciplinarity, co-operation between administrative levels, critical reflection on uncertainties, assumptions and mental models, and utilisation of information.

Discussion

The developed evaluative framework has been useful in the analysis of regimes and information management and appeared to be comprehensive. A qualitative evaluation of the extent to which the regimes support adaptive management has been performed by researchers with expertise on specific basins. Some quantification of scores has been done by one researcher and has been checked by the other researchers. Consequently, the scoring is to some extent subjective. Furthermore, the scores are relative, because it was impossible to identify 'reference regimes' that do not at all - or fully - support adaptive management. As a result, the scores can only be used in an indicative way.

Conclusions and recommendations

The extent to which the regimes and information management in the studied basins support adaptive management varies significantly, and so do the activities that can be undertaken to stimulate adaptive management. Transitions towards adaptive management have to be executed step-by-step and might take decades. Goals and ambitions should be adjusted to the current situation to make sure they are feasible. The well-developed regimes in the Rhine and Elbe basins can focus on activities such as cross-sectoral co-operation and consideration of uncertainties. The regimes that offer little support to adaptive management, in particular in the Amudarya and Nile basins, should focus on improving information exchange and political co-operation first.

2.3 Work done so far in the case study basins

The case studies selected for investigation in the context of the project display a variety of water management issues, institutional structures and future development trajectories. Work performed so far in the WP took into account all NeWater case studies to obtain an overview of the main challenges and possible similarities among the basins. Of the NeWater case studies a smaller set of case studies was chosen for a more thorough investigation in the framework of WP 1.3 – the Amudarya, Orange and Rhine basins. The selection was based on interest voiced by stakeholders in the region as well as initial research performed by the

WP team. The following sections will outline the activities undertaken so far in these basins. They form the basis for the second 12-months period, which is addressed in chapter 3.

2.3.1 Amudarya Basin

2.3.1.1 Summary of 1.3.1 CS report

The NeWater deliverable 1.3.1 "Amudarya basin report" was finalised in July 2005. The report provides an overview of the water management regime(s) of the Amudarya basin. The approx. 466,200 sq km. large basin streches from high mountain areas of the Pamiro-Alai-mountain system to the semi-arid to arid conditions of the Turan desert plain. While the upstream countries are highly interested in the exploitation of the hydropower potential, the economies of the downstream countries are to a great extent dependent on water for irrigation. However, water allocation is not only a conflict of upstream and downstream countries: downstream countries have severe disputes about sharing water resources among each other. Another important issue in the Amudarya Basin is the growing environmental degradation due to inappropriate agricultural practices, insufficient sewage treatment systems, etc.

In the Amudarya Basin, water management has a particular historic dimension. Central Asia has undergone the transition from centraly planned economies under the former Soviet Union to market economies after independence. This transition has a specific significance for water management, as decisions regarding water management in the Amudarya Basin shifted from a central authority to the necessity of transboundary negotiations. After the independence, the first interstate institutions emerged in order to tackle the upcoming conflicts. Today, one of the most important institutions is the Interstate Commission for Water Coordination (ICWC) that is responsible for the whole Aral Sea Basin. The operative branche of ICWC acting in the Amudarya is the Basin Water Management Organisation (BVO). Another organisation active in transboundary water management is the International Fund for the Aral Sea (IFAS) that was established to manage and co-ordinate the funding of projects and programmes in the Aral Sea Basin, of which the Aral Sea Basin Programme (ASPB) is the major initiative in the basin. International donor organisations like the United Nations Development Programme, the World Bank and others promoted these interstate organisations. Nevertheless, transboundary co-operation to a large extent suffers from mutual mistrust and insufficient willingness to enter into an open dialogue on sensitive issues such as irrigation schemes.

Information management in this context is of great importance but at the same time this is also one of the most delicate issues in transboundary negotiations. Information exchange in the transboundary context is far from satisfactory in the Amudarya Basin. This notwithstanding, this issue is widely recognised in the basin and first attempts were made to provide a better basis for decision making at the transboundary scale.

It can be stated that transboundary co-operation in the basin is still hindered by the lack of serious commitments from the institutional, legal and practical points of view. However, the review of transboundary water management regimes in the Amudarya Basin revealed promising attempts for meeting current and new challenges in water management.

2.3.1.2 Stakeholder Interactions

The assessment of research needs has been completed in close co-operation with the case study project partners and the stakeholders in the Amudarya Basin from the beginning. Two major meetings were held in Tashkent, Uzbekistan, so far:

- June meetings, where a first draft of research access points was discussed with local stakeholders.

- Tashkent NeWater Conference and special sessions on two possible transboundary research topics, 4-6 October 2005.

Tashkent NeWater Conference – 4-6 October 2005

The Tashkent NeWater Conference comprised two special sessions that aimed to discuss the agreed access points of the first stakeholder meeting in June. Ecologic held the chair in both sessions.

Special Session "Transition to more adaptive donor involvement in IWRM in Central Asia: the Amudarya case (Learning from experience and dialogue)"

The goal of this session was to outline best practices but also possible shortcomings of past donor projects in the transboundary context in order to identify possibilities for a more adaptive donor involvement. The further specification and development of such improved approaches will form the research agenda of NeWater Project in the next three years.

Special Session "Transition to more adaptive transboundary water management through exchange of knowledge and information"

The goal of this session was to analyse the current transboundary information exchange system in the Amudarya basin, in order to identify challenges that can be addressed by the research in the context of NeWater. These could include:

- An assessment of the current information exchange practices within the different levels (international, national, regional, local, spatial, multidisciplinary) and between the different levels
  - Information needs of the relevant actors in the Amudarya Basin at the various levels,
  - Existing procedures/methods of information exchange,
  - Identification of actors that should be involved in the research.
- Identification of opportunities and challenges presented by these practices for adaptive transboundary water management,
- Specification and development of research needs for the improvement of information exchange management in the Amudarya Basin.

2.3.1.3 Discussion of Relevant Research Topics for WP 1.3: Stakeholder Exchange

The initial exchanges with case study partners and stakeholders during the June meetings gave a first indication that the topics considered for research are of relevance. Based on this, the special sessions chaired by Ecologic in Tashkent identified various issues as supportive for NeWater research on transboundary issues.

The main topics of the discussions in Tashkent and a short summary of the sessions themselves are provided in the following section.

1. **"Transition to more adaptive donor involvement in IWRM in Central Asia: the Amudarya case (Learning from experience and dialogue)"**

Many international projects have financed both infrastructure as well as capacity building activities; nevertheless, many problems in the Amudarya River Basin still persist. Based on an evaluation of these projects, obstacles and opportunities (in regard to the adaptive water management concept) could be identified in order to come to recommendations for an improved future design of projects.

The special session at the Tashkent meeting showed that, overall, the issue is considered to be an important one. At the same time, the main setback for getting information about the relevance and feasibility of the research proposed was the limited participation of

international donors at the meeting. Due to these circumstances, the local authorities to a large extent expressed their frustration with the current overall situation at the Amurdarya, and specifically with donor involvement in the region, without being able to have an exchange with the donors themselves. More specifically, a reproaching atmosphere towards the reduced engagement (and sometimes overall withdrawal of many donors either from the whole region or the Amudarya/Aral sea issue) has to be noted. The absence of donor representatives created an atmosphere that was less productive than expected, because the expectation of authorities to meet the donors was not fulfilled.

On the positive side, important indications about the background of success and failure of different donor projects were presented, even though most of those discussed did not have a transboundary dimension.

The overall structure and size of the group did not allow for in-depth discussions. Some issues, however, could already be identified for a better understanding of the situation, for instance the communication regarding funding and project development (e.g. the reasons for the discontinuation of the GEF-funded "Aral Sea Basin Programme" were not obvious to the participants).

The overall issue of research on donor involvement (or the deficit of it) on the transboundary issue was regarded as of high relevance. After it was made clear that NeWater is not a donor project but aims to conduct research, the main elements that could be part of the research agenda where discussed and seen as important.

2. Transition to more adaptive transboundary water management through exchange of knowledge and information

The session showed the importance of the issue and was a success. A large amount of interesting information on the current status of information exchange was presented and discussed, but also concerns and possible approaches to overcome problems were presented and discussed. A main element was the deterioration of information exchange schemes dating from the time of the former Soviet Union. The evaluation of the practical implementation of transboundary agreements relating to information exchange in the last 10 years is ambivalent: the majority of stakeholders seemed to be quite critical and pointed out both implementation gaps as well as the need to develop these agreements even further. Therefore, very lively discussions took place, both when discussing the current situation (which was based on different views) as well as on different approaches to overcome them. Overall, the research topic was considered of high relevance for the Amudarya basin; the willingness of the local stakeholders to support this research seems to be very high.

On the downside, no prioritisation of the different information topics (and accordingly, scientific institutions to be involved) that NeWater research could focus on took place (but this could be one of the first tasks of the next phase). Additionally, the political dimension of information exchange was pointed out several times, reinforcing the idea of approaching the issue from a more scientific angle in order to enable exchange and interaction between the different countries. Finally, it is also very urgent to integrate the other Amudarya countries as soon as possible in the setting up of the research agenda, in order for all countries to develop ownership of this project.

2.3.2 Orange Basin

2.3.2.1 Summary of 1.3.1 CS report

The NeWater deliverable 1.3.1 "Orange basin report" was finalised in July 2005.The report provides an overview of the water management regime(s) of the Orange River basin. The approx. 1 million sq. km. large basin is characterised by strongly varying hydrometeorological conditions, which produce an extremely uneven distribution of the

water resources within the basin. Of the four countries within which the basin lies, only Lesotho can be said not to face water stress; the other three face different problems related to water resources scarcity. Due to this situation large-scale water infrastructure (including inter basin transfers (IBTs)) has been built, and more projects, particularly IBTs, are currently under review.

In view of this situation, and in line with the growing importance given internationally to integrated approaches to river basin management, the four countries initiated co-operation on transboundary water management, resulting in the creation of the Orange-Senqu River Commission (ORASECOM) in the year 2000. This river basin organisation was created in a highly favourable political climate, in the aftermath of a process of political union (which had as result the creation of the Southern African Development Community) and of widely-praised international policy- and law-making. Due in large part to its post-apartheid political process, South Africa has seen wide-sweeping reforms of the national water legislation, which as well as being based on different principles (e.g. equitable access), incorporates best-practice knowledge regarding resource management. The basin's other countries have also undergone or are currently undergoing processes of modernisation of their water legislation. Both the national and international evolution in the region present a highly favourable scenario for designing and implementing governance systems with an integrated water resources management approach.

The changes responsible for the positive outlooks for the river basin organisation are, paradoxically, also hampering its effective implementation. The basin's countries are still in the midst of restructuring their water sectors, and progress in the development of the ORASECOM has accordingly been slow. The window of opportunity for the development of this river basin organisation has been recognised by the international donor community, and a large variety of efforts have been realised or are currently being initiated. These target subjects as diverse as the structure of the organisation, the development of a strategic action programme for it, capacity building, generation of hydrometeorological information, etc.

Information production and communication is central for the management of transboundary resources. The current production of information relevant to water resources management has serious shortfalls, but this area is also showing considerable development. The generation of more hydrometeorological data, for instance, has been the focus of various efforts. A commitment to information exchange between the countries can be found in both international and national legislations, and the ORASECOM agreement commits member countries to information exchange of relevant information. Although still in its early stages, the governance system that is emerging in the basin also shows promise in this subject.

2.3.2.2 WP 1.3 in the Orange basin: Stakeholder Interactions

The interaction with stakeholders in the Orange basin was initiated through preliminary stakeholder consultations in South Africa, carried out by the case study leaders in June 2005 in Lesotho and South Africa. These meetings served to establish a first contact to the stakeholder community in the Orange basin, and to map out main issues, existing connections among the different stakeholder groups, and their degree of interest.

With water issues on a transboundary scale being a very sensitive issue, stakeholder processes need to be initiated in a considerate and careful way. The initial round of consultations will serve as a basis for further rounds of interaction with stakeholders.

The stakeholders consulted in the first round have confirmed the high level of interest in transboundary issues in the basin. However, the scoping also indicated that further specification of the direction and the specific thrust of the research focus would be needed in order to better address the challenges existing in the basin.

In addition to the interaction with local stakeholders, an initial exchange with the donor community in the region was started in late October, which will be expanded throughout the next months based on the results of the GA. The groups of donors contacted mainly involved the EU Commission, the UNDP and the GTZ.

2.3.2.3 Discussion of relevant research topics for WP 1.3

In the context of these initial consultations and contacts, various issues were identified as interesting and appealing for NeWater research on adaptive water management, and particularly for transboundary work.

More specifically, work performed in the context of NeWater WP 1.3 could provide knowledge support for the challenges to emerge in relation to the further development of the ORASECOM secretariat through:

- providing possibilities for exchange with other river basin authorities throughout the world/represented in the NeWater project (learning from peers),
- provide impulses to the development of ORASECOM policies and practices to be developed from the perspective of adaptive water management, thus broadening the scope of the current approach, which encompasses all dimensions of IWRM through a stronger focus on the transitory nature of the process,
- stimulating a fruitful debate among the research conducted in the NeWater project and the initiatives undertaken with regards to the ORASECOM to enable a beneficial exchange and transfer of information,
- using the participatory approach followed by the NeWater project to introduce this issue to the international level, and contributing to its stronger integration in the future ORASECOM governance structure,
- investigate the key implications of the ORASECOM on the adaptiveness of water management practices throughout the region.

This work would have to be performed in close collaboration with:

- the ORASECOM secretariat,
- the case study partners of WB 3 – Caroline Sullivan, Chris Dickens, Myles Mander and associated institutions and local partners,
- the donor community active in the area, with the clear goal of providing an added value to the work already performed without duplicating work,
- in consultation with the main stakeholders involved at the international, national and where possible also regional level, in order to avoid the notion of omniscient consultants from Europe.

2.3.3 Rhine

2.3.3.1 Summary/main outcome of 1.3.1 CS report

Main issues

Considering the historical and current policy agenda, the main problem in the Rhine basin is pollution and a ‘good second’ is flooding. According to recent research on climate change, severe floods and droughts are expected to occur more often in the Rhine basin. Even now,

high river discharges and floods take place regularly (e.g. in 1995 and 1998). After years of increasing the height of embankments, other types of measures, like creating more room for the river, are being considered. Moreover, increased attention is being paid to upstream and downstream effects of measures, which triggers transboundary co-operation. To a much lesser extent there are concerns about a possible increase in the number and severity of dry spells.

Transboundary regime and information management

The results of the analysis of the regime and information management in the Rhine basin in the light of adaptive management are summarised in Table 1. Activities to stimulate adaptive management in the basin should be aimed at developing the elements that are currently underdeveloped.

Table 1. Evaluation of regime and information management in the Rhine basin

Well-developed elements	Less-developed elements
▪ Technical and political co-operation in the International Commission for the Protection of the Rhine ▪ Many interactions between governments, NGOs & scientists ▪ Comprehensive legal framework ▪ Basin-wide policies ▪ Policy implementation ▪ Long-term horizon ▪ Flexible measures ▪ Information production & dissemination	• Cross-sectoral / interdisciplinary co-operation • Co-operation between government levels • Consideration of uncertainties & assumptions • Provisions for change of law and policy • Policy experimentation • Utilisation of information • Use of multiple resources

2.3.3.2 Stakeholder interactions within the Rhine CS on transboundary work

So far three Dutch stakeholders were interviewed in the establishment of D131: International Association of Waterworks in the Rhine catchment area (IAWR), NGO *Stichting Reinwater*, and the citizen's initiative *Hoogwaterplatform*.

More interactions with stakeholders in the Rhine basin have been planned in several sub-cases:

- Basin-wide scale & influence of EU policies;
- Transboundary case Niederrhein;
- Emscher case;
- Waterboard Stichtse Rijnlanden case.

The basin-wide 'research' will be based on an upscaling of the insights from the Niederrhein case (and there will probably be no or little interaction with stakeholders at the basin-wide level). The transboundary Niederrhein case is therefore of utmost relevance to WP1.3. There is a dialogue going on between the RBA Centre and the Dutch RIZA & RWS-DON about the research activities is this case. The idea is to involve all participating (government) stakeholders in the Dutch-German 'Working Group for Flood Management on the Niederrhein' in several workshops.

2.3.3.3 Discussion of relevant research topics for WP 1.3

Transboundary flood management seems a relevant issue for WP1.3. Flood management is a complex problem, characterised by (socio-economic and climate) change and uncertainty. Furthermore, many actors with different perceptions of problems and solutions are involved.

As a result the issue is also relevant from the point of view of adaptive management. The ongoing process in the Niederrhein area offers opportunities to test some methods and to support a transition towards more adaptive management. The support should be particularly aimed at the less developed elements in Table 1. Specific demands of the Dutch-German working group are to improve interaction between policy researchers, decision-makers and water managers and to create shared insight in flood management measures and how they can be adjusted between the Netherlands and Germany.

The WP 1.3 Rhine case study work focuses on the transboundary regional co-operation between German and Dutch actors concerning flood management on the Niederrhein (in the Dutch-German working group on Flood Management). The research goal is to explore to what extent participation and modelling can be used to support the development of a shared long-term vision, and the exploration of management strategies for flood management on the Niederrhein.

2.3.4 Tisza

The Tisza was also analysed in the context of the work package and a preliminary report has been prepared on transboundary regime issues. In addition, Ecologic has participated in the second stakeholder meeting in the Tisza basin on 21 – 23 May 2005 in Sarospatak.

This meeting offered an opportunity for exchange among stakeholders from Hungary and the Ukraine on flood risk management issues. It became clear that information on different aspects of flood risk management is available in both countries, but that there is hardly any exchange, and thus only limited knowledge about the approaches and policies taken in the neighbouring country.

While the WP does not provide enough financial means to provide full support for the investigation of transboundary issues, some input and support will be provided in the context of other work packages with a relation to transboundary aspects.

2.3.5 Other CS Basins

2.3.5.1 Nile basin report

With support from contacts obtained through the case study leader, information was gathered on the identified elements for describing the transboundary regime and the information management in the Nile River Basin.

Developments in the Nile basin draw heavily upon the Nile Basin Initiative. This NBI is a joint effort of the Nile riparian countries, together with international donors, to come to a shared management of the river basin. The NBI incorporates the latest concepts of integrated water resources management towards adaptive management and therefore provides an excellent opportunity for the Nile River Basin to be managed in an adaptive way. Nevertheless, the activities under the NBI are not supported through legal frameworks and have to work around the gaps and inconsistencies of the existing legal and policy frameworks. Implementation of the NBI is hindered by this lack of regulatory support. In addition, the socio-economic situation in the riparian countries does not yet allow the countries to take sustainable measures even if defined. It is concluded that the building blocks for adaptive management are present but cannot be put in place due to the socio-economic and political situation in the basin.

2.3.5.2 Guadiana basin report

With support from contacts obtained through the case study leader information was gathered on the identified elements for describing the transboundary regime and the information management in the Guadiana River Basin. The information, however, was not sufficient to

fill in all the required elements. Much of the information on the Guadiana and the water management situation on the Iberian peninsula is available in Spanish or Portuguese only. The Guadiana CS WP has been asked for support in this.

The developments in the Guadiana River Basin are progressing under pressure of the EU Water Framework Directive. The current political and legal framework in both countries is however not ready for balanced co-operation between the countries. One important feature behind this lack of co-operation may be found in the upstream country being more powerful in socio-economic and political terms as well as from the hydrological point of view. The EU WFD should improve this situation, bringing the opportunity for a more balanced and therefore sustainable joint water resources management.

2.4 Dissemination Activities

Ecologic presented its current work on Hydropolitics at an DFG Workshop on 21/22 April 2005 hosted by the Centre of Development Research (ZEF) in Bonn. It was the aim of the workshop to bring together and interlink research conducted in Germany and elsewhere on the interlinkages of water, politics and development. The workshop was attended by a variety of German research institutions active in this field. The presentation by Ecologic outlined hydropolitical challenges using NeWater as a reference project.

Ecologic prepared a poster on the work performed in work package 1.3, which was presented at the Workshop on the implementation of economic aspects of the Water Framework Directitive on 7 – 8 July 2005 in Leipzig. NeWater Flyers where also prepared and shown at other conferences.

Ecologic submitted a paper to the ‘International Conference on Regional Co-operation in Transboundary River Basin’ held in Dushanbe, Tajikistan on May 31 - June 1 2005. The paper was accepted for presentation.

The RBA Centre has produced a poster ‘Transboundary regimes and adaptive management’ that will be presented at the yearly conference of the Netherlands Centre for River Studies. The poster is based on D1.3.1 and presents the main results, using the Rhine as an example. A short article will be included in the proceedings of the conference. There are plans to write a more detailed article based on the analytic framework or the results of the analysis of D1.3.1.

3 Future Agenda

The research agenda details the activities to be performed in WP 1.3 for the project months 12 to 30. This document was expanded after discussions with WP partner organisations, case study representatives and stakeholders during the NeWater General Assembly in Playa de Palma.

These discussions will also address the potential allocation of resources to each partner in the WP for the coming project months.

3.1 Adaptive Water Management in the Transboundary Context – revisited

This chapter will detail the current understanding of the main thrust of NeWater, from the perspective of the work performed during the first ten months in the context of WP 1.3.

(1) When picking up on the overall discussion on the elements and significance of adaptive management, it can be said that conceiving a "one-size-fits-all" approach towards adaptive water management for transboundary water regimes is in most cases not appropriate. This observation leads to a heightened relevance of research focused on the mechanisms and processes under **specific circumstances** rather than an elaborated testing of general ideas and concepts.

(2) Furthermore, other findings indicate that in transboundary regimes the discussion of the '**politics of (water management) policy**', i.e. the overall hydro-political dimension of resources management, is of high relevance, and that again generalised statements might not be conducive in this regard. To illustrate this statement, it could be said that the development of transboundary regimes towards adaptive management must be built on some balance between the countries. The comparison between countries conducted in the context of the WP so far shows that differences in socio-economic situation (and the (military) power connected to them), political situation (allowing for participation or not) and geographical situation (upstream – downstream) have a direct impact on water management policies, and that the knowledge thereof can be conducive to developing (good) co-operation.

(3) Regarding the **management of information**, it is clear that information is regarded as an important issue in transboundary co-operation. There is, however, no clarity about specification of information needs; information needs are defined often at a 'technical' level with no direct link to policies and decision-making. There is also no integration over different disciplines. An integrated approach in information production is therefore not present. In addition, although in some cases information is abundant, it is not clear how information is utilised once produced. There is again no clear link with decision-making and communication strategies are often developed, again, at a 'technical' level.

From the above it may be derived that the research in WP1.3 for the second project period should focus on:

- exploring the hydro-political relations and balance of 'power' between the countries in a transboundary river basin, and its influence on the level of co-operation and overall adaptive capacity of river basin management, as an underlying pattern for all case studies,

- specifying information needs in the context of transboundary regimes and developing recommendations concerning the production and exchange of information for supporting adaptiveness in management decisions.[1]

3.2 Overall research activities of WP 1.3

The following recommendations for further research **on the general level** were derived from the synthesis report of the individual basin reports prepared in the context of WP 1.3.

Further development of the evaluative framework for adaptive water management in transboundary regimes

The analysis underlying the synthesis report brought to light a lot of questions. Future NeWater activities should play an important role in answering these. A major topic requiring more attention is the evaluation framework for adaptive water management in transboundary regimes. Although the list of criteria and indicators did not prove to be incomplete or to contain too much overlap with the performed analysis, it is open to improvements based on growing insight into the concept of adaptive management. A major improvement would be to include the interactions between the criteria and the order in which changes towards more adaptive management occur. To obtain this type of knowledge it is recommended to perform a more detailed analysis of occurred regime changes in the past, in a limited number of basins. This type of analysis can also create more insight into the relative importance of the various criteria and indicators. A limitation to this approach is that only the part of the transition that has already occurred can be researched, which is only a minor part.

More detailed analysis of regime elements and information management

Furthermore, it would be desirable to perform a more detailed analysis of relevant regime elements and information management in the basins studied. The current report includes only a basic analysis of transboundary regimes and the results of this analysis might be biased by the somewhat fragmented information that was available. By paying more attention to specific elements of the regime, it could be possible to attain more valid insights and more recommendations for specific activities supporting the transition towards more adaptive management in a basin.

Efforts in this respect would probably have to be focused on the selected case study basins for further investigation – Rhine, Amudarya and Orange – in preparation for the activities proposed in sections 3.3. Research in case studies can be aimed not only at analysis, but at the same time at stimulating the transition towards more adaptive management. Thus, it is recommended to focus the research on the regime elements that are mentioned for each basin in the previous section.

Recommendations for the individual basins

Based on the results of the analysis, some recommendations for the development of the regimes and for additional research can be made. Two main principles need to be considered in this respect:

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[1] Main questions here are: Who specifies the information needs? How is this linked to the decision-making process? Does the available information support evaluation of policies? Next to this, the research could focus on the anticipatory character of information management. Are plans/scenarios communicated between countries, are projections/expectations (models) included in these communications and is progress on these issues monitored?

- the activities that could be undertaken to stimulate the transition to more adaptive management differ from basin to basin, a "one-size-fits-all" approach is not feasible.
- the transition has to be executed step-by-step and might take decades. Goals and ambitions have to be adjusted to the current situation to make sure they are feasible.

Regarding the individual case studies, their stage of development and thus their research requirements:

(1) The Rhine[2] regime is already well-developed, therefore the transitions towards more adaptive management can be focused on activities like stimulating co-operation with other sectors and disciplines and critical reflection on uncertainties, assumptions and mental models, using informal networks in order to overcome political deadlocks.

(2) The Orange regime has seen the emergence of new institutional arrangements through a practical strengthening of the ORASECOM. The key process here is rendering the transition from 'theory to practice' for this young institution. In this context further emphasis could be placed on intensifying information exchange and the utilisation of information, and also on developing a stronger, more suitable legal and financial structure. Assessing the role of international donors vs. national government in the area of IWRM could be an additional key area for research.

(3) In the Amudarya basin it might be useful to utilise information exchange based on the needs and experiences of the research communities; other actions could include directing donor involvement towards more adaptive transboundary co-operation, and start focussing on the development of technical exchange co-operation in order to create adequate technical capacities and mutual confidence.

Exploring opportunities for learning through experience

The activities conducted in the context of WP 1.3 will feed into the collation of a pool of knowledge and exemplary cases on transboundary river basin management, based on the experiences made in the three selected case studies and evidence drawn from other NeWater river basins.

This collection will comprise best practices, as well as challenges faced and problems encountered in the course of IWRM. This pool of knowledge, on the one hand, will help to better understand the specific situation in the case study area, and on the other, offer a selection of approaches to take and strategies to employ. In this sense, the knowledge pool, rather than representing a defined set of universally applicable tools, will provide a source for learning from and through experience.

Approaches represented in this pool of knowledge will address different stages of river basin management development, as well as different contexts by responding to the requirements established by an adaptive water management agenda. At the same time already existing approaches will be incorporated and further developed to provide for a truly thorough and innovative thrust.

3.3 Activities in case studies

This chapter will detail the approaches envisaged for the work to be performed in the individual case studies in the coming project months.

[2] The situation here is comparable to the Elbe regime.

3.3.1 Amudarya

Two main access points have been identified during the consultation process with the stakeholders and project partner in the Amudarya Basin. These are:

- Transition to more adaptive transboundary water management through exchange of knowledge and information;
- Transition to more adaptive donor involvement in IWRM.

While the first approach is a synthesis of the former research foci "information" and "regime", the latter appeared to be of special relevance for the Amudarya Basin and was additionally added to the Agenda.

In the following section the chosen access points are described in detail.

3.3.1.1 Transition to more adaptive transboundary water management through exchange of knowledge and information;

The stakeholder consultations showed that transboundary regime topics, especially the issue of information, have become a politically very "loaded" and therefore important issue. Nevertheless, the exchange of knowledge and information is seen as one of the most pressuring aspects of regime and governance structures. The concentration of research on these exchange mechanisms offers the main advantage of being a direct response to stakeholder needs in combination with a breakdown of (political) complexity when approaching the issue from a scientific point of view.

The demand for information on the transboundary scale concentrates on the following issues:

- water availability,
- water losses through evaporation,
- other water losses (leakage factors etc),
- status & development of water quality,
- economic data on agricultural production,
- energy generation,
- best available techniques for irrigation & hydropower generation.

A first step for further research would be to select some of these topics and focus the research on them (based on further stakeholder interactions, see below).

The analysis of the information exchange mechanisms should concentrate on the level of research activities in order to avoid political hesitation. The information exchange is important in terms of quantity (e.g. how much water is allocated to the different riparian states) as well as in terms of quality (e.g. the increase in groundwater pollution over the last decade). The analysis should involve all riparian states to the Amudarya if possible, utilising the opportunity of drawing back on informal networks from former times.

In more detail, the NeWater research will focus on the following main aspects:

- Identification and prioritisation of the various information topics,
- Assessment of the current information exchange practices within the different levels and between the different levels (international, national, local, multidisciplinary),
- Scoping phase: information needs, existing procedures/methods, actors (existing and needed).

This research will be based on in-depth literature review in combination with qualitative interviews with key-stakeholders in the basin, in order to really understand what **the practice** and not the theory of information exchange is in the Amudarya basin. Parallel to this, intensive discussions will further sharpen the on-going research. These discussions include interviews/small workshop sessions with small stakeholder groups **from all Amudarya countries** in spring 2006. Target participants for these meetings need to be specified further, but should include BVO, Hydromets and other (scientific) institutions. These interactions in the spring of 2006 should lead to a:

Study on the current knowledge and information exchange practices in the Amudarya: main topics and current needs

Based on specific research on the current situation and the first ideas generated in the Spring workshops, a larger event could be held in October 2006, that would bring together the research communities of all countries. The aim would be to discuss the analysis of the current information exchange practices, ideas for improving the information situation, and developing a more adaptive approach to information management. Technical questions could be carried back to the NeWater consortium.

The outcome of this process would be summarised in an ***"Analysis for an improved and more adaptive exchange of knowledge and information from a scientific point of view"*****,** which should be concluded at the end of 2006 . At the end of the project (but starting with this report), practical proposals on the most pressing information issues should be identified, as well as ways to overcome them (initiate investments, capacity building, donor involvement, etc.)

3.3.1.2 Transition to more adaptive donor involvement in IWRM

This approach has been proposed, discussed and selected as relevant through the consultation process with the stakeholders and project partners in the Amudarya Basin (see chapter 2.3.1.2).

The resulting proposal is to focus the research on an ***improved understanding of the efforts/approach taken by international donors on transboundary projects at the Amudarya and their effects***. Research would be correspondingly based on interviews/discussions with donor organisations (local branches but also headquarters, current but also former project staff) as well as with the local authorities (of all Amudarya countries), targeting the following questions:

- What was the historical political context at the time these projects were ongoing?
- What has the approach to donor involvement in the transboundary context been in the past?
- Why was the selected approach taken? What were the goals of the project(s)? If no transboundary projects where initiated, which were the reasons?
- How were these projects perceived in the respective countries? Were there differences in the mindset/approach towards the project objectives/implementation?
- How were the needs of receiving countries taken into account in the project design and implementation?
- Which where the mechanisms for compliance monitoring, ensuring transparency of the process, reaching agreements and decision-making?
- What were positive experiences with respect to transboundary collaboration in these projects?

- What were the obstacles and hindrances? At what level did efforts succeed, where did problems arise?

Most of the projects that include a transboundary dimension are extended to the whole Aral Sea Basin and are not limited to the Amudarya Basin. Therefore it needs to be specified if past/present projects to be analysed should also be expanded to Aral sea projects or if the focus should be restricted to the Amudarya Basin. Additionally, it should be considered if experiences of donors in other transboundary basins can be included so as to achieve additional insights.

This in-depth analysis could serve as a first step towards a better understanding of what achieved positive results and what prevented better results regarding donor involvement in the Amudarya case. Thus, the adaptiveness of donor involvement in the Amudarya could be assessed by receiving an external view on mechanisms for transboundary water resource management in the Amudarya basin as linked to donor projects. *The output would be a scoping study to be prepared by mid 2006 (Month 18 of NeWater).*

This would be used as basis to develop ***research on main elements of adaptive donor involvement in transboundary contexts (improved approaches), considering specially the Amudarya case*.**

If appropriate, the results of the scoping study would be presented and discussed at a large scale workshop in the second half of 2006. Based on this, the next phase of research would try to identify what the main elements for improved donor involvement could be, taking into account the needs of the Central Asian nations. This includes also the possibilities for better co-ordination among donors. It would be very beneficial if NeWater could work together with one main donor institution and the national representatives in order to include/"test" this approach in one specific current/new project at the Amudarya.

The output would be a short study outlining these main elements and the potential set-up of an application within a current/new research project at the Amudarya (Mid-2007, Month 36 of the NeWater project).

Next steps

In order to continue working on this issue, the donors that had been contacted before the Tashkent 2005 workshop need to be informed about the results of this workshop in order to define their interest in interacting with the NeWater project. In case the interest is limited or too diffuse, this research topic in general would have to be dropped, since this kind of research is only possible if some ownership and interest is developed by the involved actors.

In case at least 1-2 donors show interest and some commitment, the research agenda will be specified further in order to form the next 18-month research plan for the WP 1.3 of NeWater.

On the other hand, the representatives of the Amudarya countries need to be interested in co-operation and share their experiences with transboundary donor-financed projects in more detail and depth. Judging from this first exchange, this seems feasible and not a restricting factor for research.

Another important aspect to be tackled would be to expand the participation of this research to all Amudarya countries in order to get an overall picture of the possible way forward to a more adaptive donor involvement from all Amudarya basin countries.

3.3.2 Orange

Two main areas for a potential involvement in the Orange basin have been identified following the initial consultations with the stakeholders in the region:

- Organisational development of the ORASECOM,
- Adapative donor involvement in IWRM in the Orange basin.

Both research strands will address the initial research foci on institutional analysis as well as information management.

The activities in WP 1.3 will be closely linked to the work performed in WP 2.6 on scenarios in the Orange basin. In this respect, WP 1.3 will address the aspects of political change and institutional variability as part of the vulnerability and uncertainty analysis in the context of 2.6. As such WP 1.3 activities will contribute to the identification of adaptive management actions in the basin, which will be used for the future development of indicators, tools or incentives to foster capacity-building for adaptive water management in this respect.

The following sections will detail the planned work in the two focus areas.

3.3.2.1 Organisational development of the ORASECOM

While bilateral agreements have tradition in the region and have been used to clarify the relations of individual states in the context of water management, a multi-lateral institution, the ORASECOM, has only been established very recently. This young organisation aims to provide a platform for negotiations on water quality and quantity issues as well as the sharing of knowledge and experiences. The establishment of this joint body marks a step in the right direction. Whether it will contribute to more transparency in decision-making, better stakeholder involvement at the national and international level and the sustainable management of the water resources in the region in an equitable manner will only emerge in the years to come.

Without doubt the ORASECOM constitutes a major step forward in sustainable water management in the entire region.

The contribution of NeWater and specifically work package 1.3 could provide for a tangible assessment of the current and the future institution-building process from the perspective of adaptive water management. This activity would provide ORASECOM with a strong link to current research undertaken on several aspects of IWRM, and on the other hand ensure the direct transfer of experiences among all actors involved.

3.3.2.2 Adapative donor involvement in IWRM in the Orange basin.

The second research focus is directly linked to the previous one as it investigates a side aspect of the institution-building process for the ORASECOM.

Currently, there is considerable donor activity in the Orange basin, which focuses on strengthening the institutional set-up of the newly created river basin organisation – ORASECOM.

The main actors - currently very active in this respect - are the following organisations:

- German GTZ,
- French GEF,
- European Union, through several initiatives,
- UNDP.

These organisations made available or intend to make available significant funds for supporting the institutional development of the ORASECOM. For example, the German GTZ plans to provide advice on the organisational development of the Commission as well as maintaining the process at the international level in the Framework of the SADC community and the AMCOW. Emphasis has been placed on information management, networking across national borders and co-operation. Finally, the harmonisation of African

water policies in the SADC region is promoted as an important pre-condition for transboundary collaboration.

The EU, through its Water Initiative, intends to carry this positive development further by placing an emphasis on delivering concrete results with view to achieving the MDGs by 2015. An important issue discussed in this context is the decision on concrete investment in infrastructure and other projects.

There seems to be a current need to assess the current level of donor co-ordination in the region as well as the extent to which their activities will be conducive to effecting the transition to a more adaptive water management regime. WP 1.3 activities could evolve around the identification of the potential and of the opportunities for harmonising different funding and support schemes so as to facilitate and enhance the further development of the ORASECOM secretariat in the light of adaptive water management.

3.3.3 Rhine

The text below presents a proposal for the support that the RBA Centre can offer to the project 'Transboundary adjustment of flood mitigation measures', which is part of the work programme 2002-2007 of the German-Dutch working group on flood management (WGFM). The proposal is still open for discussion.

According to Rita Lammersen of RIZA, who participates in the WGFM, a better involvement of water managers and policymakers in the work of the (more technical oriented) WGFM is desired. Within the project 'Transboundary adjustment of flood mitigation measures', a few workshops have already been planned to decide which measures need to be analysed with the help of detailed computer models and to disseminate the produced results of the planned modelling. Adjustment of measures between Gelderland and Nordrhein-Westphalia, as well adjustment between this entire Niederrhein area and areas upstream and downstream play a role in the project. Moreover it is important to adjust flood management to (possible) developments in climate and socio-economic conditions. The meaning of 'adjustment' can however only be made explicit when the goals of the adjustment are determined.

Thus, RBA proposes to aim their research at the following question:

Which shared, long-term vision can be developed for flood management in Nordrhein-Westphalia and Gelderland?

There are many possibilities to support vision development with participative methods. A proposal has been made to invite a group of relevant actors for a number of workshops. Besides members of the WGFM this can include representatives form other sectors (e.g. spatial planning) and non-governmental stakeholders. In the preparation of the workshops a number of interviews will be performed. The proposed group activities can be organised during the workshops planned by the WGFM, but organising at least one workshop specifically aimed at the NeWater research is preferred.

During the first workshop, the current situation concerning transboundary flood management as well a vision for the situation in e.g. 2050 will be developed. The participants would discuss the most important physical, socio-economic and institutional factors and their interrelations. This is visualised by developing a conceptual model, which relates the relevant factors using arrows (indicating positive and negative relations). This way, joint insights in the relations within the system would be created.

On a subsequent workshop a bridge between the current situation and the vision can be developed, by exploring scenarios for autonomous developments and by exploring management strategies aimed at realising the vision.

The information produced at these meetings will be structured and recorded using an integrated model structure. This model will provide an overview of available and missing information and of the areas in which uncertainties are large. Based on this overview, required research can be specified. The development and application of a detailed set of models for the simulation of hydrodynamic, hydrologic and atmospheric processes has already been planned within the ACER project. Additional analysis of ecological, financial or institutional aspects might however be needed. The more detailed (modeling) studies and the participatory methods of the NeWater project will be performed parallel in time, so that they can strengthen each other. Feed-back of analysis, assumptions and results to participants is essential. To keep the overview, the new information will be integrated in the model structure.

In short, the proposed research offers the following added value:

1. The transboundary flood problem is analysed from a broad perspective: physical, socio-economic and institutional aspects are included;
2. Individual interests, values, norms and perspectives are made explicit and are translated into shared goals. In particular when the group of participants will be broader than the WGFM, a rich perspective and a broad support for the developed insights can be developed;
3. A long-term vision on flood management is developed, which takes long-term changes in climate, socio-economic and institutional context into account;
4. The research contributes to giving direction to more detailed analyses, resulting in the production of information that is relevant to the participants. Detailed information will be integrated into a comprehensive framework.

Within the TU Delft, RBA co-operates with a post-doc from the section Policy Analysis of the Faculty of Technology, Policy and Management. Seecon will help by facilitating the workshops (which will probably in the German language). Some co-operation will be established with Osnabrück University and Seecon for comparing participation and modelling in the Niederrhein and Emscher (and possibly Stichtse Rijnlanden) case study.

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