



NeWater

D 1.3.5a: DETERMINANTS OF TRANSBOUNDARY WATER MANAGEMENT IN THE AMUDARYA BASIN

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NEWATER DELIVERABLE 1.3.5 A
Report of the NeWater project -
New Approaches to Adaptive Water Management under Uncertainty
www.newater.info

Title	Transboundary Regimes in the Amudarya Basin
Purpose	Determinants of transboundary water management in the Amudarya basin
Filename	D1.3.5a_Amudarya_Ecologic_final
Authors	Nicole Kranz, Antje Vorwerk
Document history	Final version
Current version.	Final version
Changes to previous version	
Date	June 2008
Status	Final
Target readership	NeWater research community
General readership	External experts at selected workshops
Correct reference	<i>Kranz, N. & A. Vorwerk (2008) Determinants of transboundary water management in the Amudarya basin, Newater Deliverable D 1.3.5a. Online available at www.newater.uos.de</i>

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Ecologic – Institute for International and European Environmental Policy

June 2008

Prepared under contract from the European Commission



Contract no 511179 (GOCE)
 Integrated Project in
 PRIORITY 6.3 Global Change and Ecosystems
 in the 6th EU framework programme

Deliverable title: Amudarya Report
Deliverable no. : D 1.3.5 a
Due date of deliverable: Month 32
Actual submission date: June 2008
Start of the project: 01.01.2005
Duration: 4 years

Policy Summary

This report details the current status with regards to information management in the transboundary context of the Amudarya basin as well as the role of donor in this regard. The report specifically focuses on mapping the type of the transboundary regime and an analysis of gaps with view to its adaptiveness as well as an assessment of the potential for transition.

Regime type and gap analysis. Transboundary water management in the Amudarya Basin is an overwhelmingly prediction and control based regime. In all riparian states, decisions are taken at the highest governance level, lower levels as well as other stakeholders are rather not included in the decision making process. Albeit significant efforts have been made to create appropriate institutions at the transboundary level, the set-up still remains fragmented, contradictory and partly ineffective. These weaknesses also have adverse effects in regard to information management and the involvement of donor organisations.

Uncertainties that may derive from information management clearly belong to the epistemic uncertainties. The current system of information management and exchange in the Amudarya partly results in limitations of data. In the first place the insufficient technical equipment leads to an incomplete picture of the status of water resources. In addition currently there is no unified data collection system used by all the riparian states. As a result available data is often incongruent and difficult to apply at the basin scale. Furthermore, the current top-down approach in the Amudarya Basin significantly hampers information flow. High-level government bodies have little connections to the lower level. The same is true for the exchange of knowledge among different sectors. As a result information on reciprocal influences and effects of other sectors to water management are fragmented and incomplete.

In the light of these considerations the adaptive capacity of the information management system in the Amudarya Basin appears to be weak. Under these circumstances the current approach to water management will have difficulties to identify occurring changes and/or risks. There are however some encouraging initiatives that appear to set the first stones into the direction of more adaptive management styles.

Potential for transition to adaptiveness. In regard to information management and exchange there are attempts to improve the availability and flow of information. The existing network of Hydromets in the five Central Asian states sets a good basis for further improvements. The Hydromets conduct mutual training workshops that aim at education and knowledge update for the Hydromet scientists. These efforts are partly own initiatives and partly supported by donor organisations. In the context of the upgrade of the data collection system existing biases have to be considered. The attempt to establish a regional Hydromet with the objective to establish a unified database for the (Aral Sea) basin failed due to reluctance of the national Hydromets. As a lesson learned that can be drawn from this experience other instruments should be developed for a better and basin wide access to relevant information.

In regard to a better understanding of the water management system and a better cooperation among sectors an emphasis has been put on the assessment and further development of national strategies. Kazakhstan is a forerunner in this respect. Even if not belonging to the Amudarya Basin the Kazakh experiences may set guidelines to water strategy development currently in process in Tajikistan, Turkmenistan and Uzbekistan. Coherent national water strategies of the riparian states would also further contribute to interstate arrangements as they provide for clearer positions and more transparency also in transboundary negotiations.

The current review and arbitration of an interstate agreement for the Amudarya Basin points in the same direction. Raadgever et. al identified a complete and clear legislative framework for transboundary co-operation as one of the core prerequisites for adaptive management. At the moment the process appears to be difficult and important issues such as an agreement on information management are unlikely to be resolved in the near future. The ongoing process however is first step. The inclusion of Afghanistan into the negotiation process and the discussion of issues neglected so far gives opportunities to provide for new impulses towards more adaptiveness.

On the supra-regional level that goes beyond the basin scale there are also drivers that could be able to direct water management into new paths. Platforms such as the Asian Pacific Water Forum may not have concrete influence on the practical side of water management; they may however contribute to discussions from a more global perspective.

The involvement of donors that significantly contribute to the financial back-up of the needed improvements in water management, also play a major role on the way towards adaptiveness. On the transboundary level however a focal point that could provide for a better co-ordination is not in place.

To summarise, the case of the Amudarya Basin demonstrates, that the transition from a hardliner top-down approach that represented water management under the Soviet Union to an integrated water resource management that opens up for new and more adaptive solutions is a long and difficult process. It also gives evidence that solutions that have been successful in other parts in the world cannot be applied on a one to one basis in other regions.

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1 Introduction

With 261 transboundary river basins covering 45.3% of the world's surface (Wolf, T. A. et al., 1999), interstate co-operation is crucial for the management of the world's waters. As a result the transboundary aspects of water management constitute an important field for investigations in the context of NeWater.

The challenge of integrated water resources management is more complex in the context of transboundary water bodies, as management paradigms of different riparian states need to be co-ordinated and aligned. The architecture of interstate co-operation mechanisms determines the boundaries for the opportunities and threats to integrated water resources management and for the transition to more adaptive approaches to water management, in view of the existing and growing conditions of uncertainty. The analysis of transboundary governance structures is therefore a highly important contribution to the identification of those key factors which could act as promoters for a desired transition process.

The Amudarya Basin represents manifold features of interest in the context of NeWater research. In the past two decades this region has undergone drastic political and socio-economic changes, which have also revealed how vulnerable the catchment area is to ecological changes and the extent to which this had been ignored in the past. It provides for a live experience of a transition process that allows for insights into its promises and pitfalls. A desk study on the Amudarya Basin as well as first consultations with key stakeholders from the Basin emphasised the importance of information management and exchange, and the co-operation and co-ordination with donor organisations, for transboundary water management in the Amudarya.

The design of research activities in transboundary water management in the Amudarya Basin focused on the following aspects:

- A. Transition to more adaptive transboundary water management through exchange of knowledge and information
 - Analysis of key factors for an improved and more adaptive exchange of knowledge and information from a science perspective
- B. Transition to more adaptive donor involvement in IWRM
 - Assessment of options for multi- and bilateral donors in transboundary projects targeted to support adaptive water management in the Amudarya basin.
 - Exploration of the role of donors in improving information management in water management in the Amudarya basin. This task will be performed with consultation of relevant donor organisations as well as representatives from government bodies, interstate organisations such as ICWC, IFAS and BWO, and national and international NGOs.

The field research in the Amudarya Basin was mainly based on expert interviews in three of the riparian states to the Amudarya Basin: Tajikistan, Turkmenistan and Uzbekistan. In addition, an introductory workshop in October 2005 as well as an expert workshop in 2006 were held in the region, in order to provide a platform for feedback on the research targets.

Chapter 2 of this report presents an introduction to the background of water management in the Amudarya Basin, its historical origins, and the legal and political framework of water management. Chapter 3 and 4 provide an overview of current practices and challenges



within these two research foci. While Chapter 3 depicts the practical efforts in information management and exchange, Chapter 4 focuses on the processes of donor involvement.

Chapter 5 describes the elements that represent prevailing uncertainties to water management in the Amudarya Basin and sets the first basis for an analysis of water management in the Amudarya Basin.

Chapter 6 is dedicated to the identification of prerequisites that favour or hamper adaptive transboundary water management. This analysis of the case study will contribute to the further development of an analytical framework to transboundary management regimes under work package 1.3 of the NeWater research.



2 Setting the scene: Transboundary co-operation in the Amudarya Basin

2.1 Water management approach

The history of water management in the Amudarya Basin is characterised by the very specific transition from a centrally planned approach to a resource management where newly independent states compete in one basin for the same resource. Since this constellation is quite unique it is important to understand the historic background and the rationale behind the water management practices that are to date present in the Amudarya. This chapter will first describe the historic background of water management, followed by an illustration of modern practices; it will then proceed to outline the currently existing legal framework in the Region.

Past approaches

Water management under the Soviet regime was purely oriented at considerations of its centrally planned economy. Environmental concerns were usually not taken into account or only in the case of extreme events, such as serious water shortages.

Water resources were managed centrally after 1923, with water resources being considered as property of the Soviet Union. The main objective of water management in the USSR for the Central Asian region was to provide irrigation for as much land as possible, due to favourable soil and climatic conditions for agricultural production, with unfavourable water availability. Large-scale irrigation infrastructure was installed throughout the region, specifically to support and enable vast cotton monoculture systems.

In Soviet times water was a resource made available almost free of charge. Due to this, efforts for effective water use under the irrigation schemes had a very low priority. As a consequence, severe economic losses affected the countries of Central Asia due to out-dated infrastructure and environmental degradation. Local water users hardly felt responsible for water resources, also because of contradicting and complex structures in the water administration (Sehring, 2002).

2.1.1 Current

Whereas the region has gone through far-reaching changes in political terms, in terms of its approach to water management the situation has not changed significantly. Cotton monoculture still prevails in the downstream countries and the situation is even aggravated by the pressure of the transition to market economies. The transition forces the newly independent states to give priority to short-term solutions in order to assure the annual crop production for meeting export demands, but also to ensure food security for their growing populations. Currently, efforts are being undertaken to increase the efficiency of water use for irrigation, the success of which still needs to come to fruition (UNECE/UNESCAP, 2004). While the downstream countries concentrate on irrigation as the main water use, the upstream countries Tajikistan and Afghanistan have serious ambitions to extend their hydroenergy sector. These plans have significantly exacerbated the interstate negotiations (Khoshmukhamedov, pers. comm., 2007).

2.2 Current water policy with view to transboundary regimes

Water policy in the Central Asian region is currently determined by a number of factors, which include:



- grappling with the problematic legacy of the former Soviet Union, in terms of institutional structures, but also environmental damages,
- their own transition process to new political regime types and the limited institutional capacities to deal with pressing water management issues,
- declining quality of life for the population.

In such a transient political state and considering the actual and looming environmental crises, interstate conflicts on an important resource such as water had been anticipated by the international community (Weinthal, 2002).

This notwithstanding, the prevailing pattern of interaction is that of regional co-operation and the development and improvement of regional relationships. This is even more surprising considering the asymmetrical allocation of water use rights in the Syrdarya and the Amudarya basins, the general uncertainty in terms of social, political and economic development, and the initially unilateral relations with international organisations, which might have led to independent decision-making and a decline of regional co-operation.

On the contrary, particularly the involvement of international organisations is considered crucial for inducing the current collaborative framework of interaction in Central Asia. Especially on the transnational level, donor organisations have been very active in enforcing negotiations and thus helping to create co-operation agreements on the transboundary level. These organisations have assumed the role of a 'third party' by providing financial resources and other assistance in form of institutional advice - direly needed by the transition states - in order to strengthen their internal domestic capacity which is essential for interstate co-operation (Hannan, 2006, pers. comm.).

The UNECE Convention on the Protection and Use of Transboundary Water Courses and International Lakes¹ and the Strategic Partnership on Water for Sustainable Development are considered as an overarching framework for institutionalising international collaboration in this region, as well as in others. The *1992 UNECE Convention* is the most relevant convention for Central Asia. On November 28, 2003, the Parties to the Water Convention adopted amendments to articles 25 and 26 of the Convention by decision III/1, following a proposal by the Government of Switzerland, to allow states situated outside the UNECE region to become parties to the Convention. This amendment has been ratified by six member states so far and will enter into force with the 23rd ratification of parties.

The Convention was signed in 1992 in Helsinki, developed under the auspices of the UNECE and is essentially made up of two parts. Part I contains provisions relating to all Parties of the Convention, whereas Part II sets out provisions relating to Parties riparian to a given transboundary watercourse. Whereas Tajikistan, Kyrgyzstan and Turkmenistan have not yet signed the Convention, Uzbekistan joined the convention on September 4, 2007. It is however, strongly recommended by international donors that the other riparian states also join the convention, in order to facilitate the further development of the current management regimes. Equally, the 1997 UN Convention on the Law of the Non-Navigational Uses of International Water Courses is currently being discussed as a possible framework for transboundary co-operation in Central Asia. This Convention focuses more on water allocation, but is in other aspects less demanding than the UNECE Convention, for instance with regards to concluding river basin agreements. This convention was also signed by Uzbekistan, on September 4, 2007, but not yet by the other riparian states (UNECE, 2003).

This still hesitant commitment to international frameworks for the management of transboundary river basins might be an indication for the length of the process that still lies

¹ Often referred to as Helsinki Convention, as it was adopted at Helsinki on 17 March 1992. The Convention entered into force on 6 October 1996.



ahead for the Central Asian states. While certainly cooperative structures have been emerging and a rapprochement of the states has taken place, pre-empting any non-civil conflicts, the implementation of these approaches still lacks in rigour. Another very important factor is the somewhat unclear role of Afghanistan in these discussions. Afghanistan, an upstream country, was largely ignored by Soviet water management. Only very few outdated arrangements existed. In the current state of affairs, the attention is still mostly focused on the four ex-Soviet states. A successful integration of Afghanistan is however crucial for achieving sustainable solutions to water management challenges in the region. Here again, international donors are the first to raise this issue and pave the way for capacity-building in Afghanistan (World Bank, 2004). While the actual role of Afghanistan with regards to water management at the transboundary level is still subject to several uncertainties, it is a widely accepted consensus in the region that Afghanistan should and has to be included as a negotiation partners. The modes and means of interaction still need to be determined.

2.3 Water law and the Institutional Framework

2.3.1 Soviet era

The regulations that were valid in the Amudarya basin during Soviet times still have repercussions on current management of water resources in the region. Therefore, a brief overview of the agreements and the institutional framework of the time before 1991 will be provided, before turning to the developments after 1991, and the current state of affairs.

In particular, two decisions in Soviet water management should be highlighted with regard to transboundary water management. In the wake of several water crises in the mid-Seventies and the early-Eighties in Central Asia, there was an increasing awareness of the need for concerted action across the region. The former USSR Ministry of Land Reclamation and Water Management (USSR Minvodkhoz) arranged for the establishment of river basin organisations (the BVOs²) and the Interstate Commission for Water Coordination to manage the resources, in accordance with regulations and schedules agreed by the Ministry. Both the ICWC and the BVOs for the Syrdarya and the Amudarya were installed in 1987 and still exist today, while having been integrated into new organisational structures (Dukhovny, pers. comm., 2007; UNECE/UNESCAP, 2004).

The allocation of water among the four Central Asian republics was based on the water development master plan for the basin drafted by the central authorities in Moscow. The four Central Asian states approved the master plan by way of Resolution 566 of the Science and Technological Council of USSR Minvodkhoz in 1987. The agreed allocation foresees a share of 0.6 % for Kyrgyzstan, 15.4 % for Tajikistan, 35.8 % for Turkmenistan and 48.2 % for Uzbekistan. Afghanistan was not an official signatory to the resolution, while previous agreements had failed to clearly specify the share of the Amudarya's water available to Afghanistan. Since the allocations specified through the Resolution is valid until new have been specified, Afghanistan's share of water as well as its integration into the system remain uncertain (Wegerich, 2005). An additional quota principle was entered for the sharing of water between Turkmenistan and Uzbekistan, which foresees an equal share of the adjusted run-off at Kerki hydrological post, and which is valid until the present day.

2.3.2 Post-Soviet era

At the international level, the Amudarya basin is very much determined by the agreements reached by the riparian states after the collapse of the Soviet Union in 1991. Efforts of the Central Asian Republics to reach a common approach concerning transboundary water

² Basseynoe Vodnoe Obedinenie.



resources culminated in the 1992 ‘Agreement on co-operation in the management, utilisation and protection of interstate water resources’³ (1992 Agreement), with Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan as signatories (Vinogradov and Langford, 2001).

With this agreement, the five Central Asian states committed themselves to refrain from any activities within their respective territories which, entailing a deviation from the agreed water shares or bringing about water pollution, are likely to affect the interests of, and cause damage to, the co-basin states (Article 3). Article 1 defines the water resources of the region as common and integral. According to Article 4, the signatory states agree to jointly undertake activities for the solution to the problems related to the drying up of the Aral Sea, and to determine yearly sanitary water withdrawals based on the availability of water resources.

The agreement led to the establishment of the so-called Interstate Water Management Coordinating Commission (IWMCC – later referred to as the Interstate Commission for Water Coordination or ICWC)⁴, which is composed of the five ministers of water management of the riparian states and which has the mandate to control and ensure rational utilization and protection of the interstate water resources. Until recent changes, the ICWC not only oversaw utilization but also aimed to provide incentives for adhering to regional water allocation regimes (Vinogradov and Langford, 2001). Together with the so-called regional Basin Water Management Organisations, BVO⁵ Amudarya and Syrdarya as operative branches, the ICWC also held responsibility for the short- and long-term water development and allocation planning, water quality control, conservation, and environmental protection⁶.

A number of other intergovernmental organisations were created between 1993 and 1995. This rather rapid emergence of new international organisations for the management of shared water resources can be explained by an interest in ensuring regional co-operation in the transitional period after the collapse of the Soviet Union (Weinthal, 2002). Organisations installed in this period include:

- the Interstate Council on the Aral Sea Basin (ICAS), based in Tashkent, Uzbekistan. It was set up with the aim of defining policies, overseeing intersectoral co-ordination and reviewing projects conducted in the Aral Sea basin with the Executive Committee of the ICAS, charged with the implementation of the Aral Sea programmes. The Russian Federation enjoyed observership status with ICAS and provided technical and financial support. The ICAS as a co-ordinating platform consisted of 25 representatives from the five Central Asian states (five from each state); the ICWC was subordinated to the ICAS.
- the International Fund for the Aral Sea (IFAS), currently situated in Dushanbe in Tajikistan. The IFAS is responsible for the management and co-ordination of funds provided by the member states (supposed to amount to 1% of the state budget), by donors, and by international organisations,

³ Signed in Almaty, Kazakhstan.

⁴ Article 8 specifies the role of the ICWC: responsible for the development of water management policy in the region, taking into account needs of all branches of industry and economy, rational use of water resources and perspective programme of water supply for the regions and measures for its realization.

⁵ Basseynoe Vodnoe Obedinenie.

⁶ Stipulated in Article 9 of the 1992 Agreement.



- the Sustainable Development Commission (SDC), formerly Interstate Commission for Socioeconomic Development and Scientific and Ecological Cooperation (ISCDSTEC), based in Ashgabat, Turkmenistan. The SDC provided for the inclusion of economic, social and environmental factors in planning processes of the ICAS at the transboundary level. UNDP was one of the main drivers of the process that led to the formation of this international commission as well as National Sustainable Development Commissions in all five states.

In the years that followed, the development of this organisational structure was heavily influenced by the drafting of further international agreements; these had the general objective of developing cooperation and improving the protection and management of water resources in the Aral Sea basin. Agreements signed in this period include:

- the **Aral Sea Basin Programme (ASPB)**. The programme was construed in collaboration with donor organisations (World Bank, UNEP and UNDP) and the five Central Asian states, and contains practical projects to be implemented at the regional level in the following areas:
 - stabilisation of the Aral Sea at a sustainable level,
 - socio-economic development of the affected areas,
 - strategy and management of the water resources of the Amudarya and the Syrdarya,
 - installation and strengthening of institutions for planning and implementing these measures.

Regional organisations were responsible for the implementation of the programme. The programme was initially designed for a period of 15 – 20 years. In May 1997 the World Bank declared the first phase complete, although some of the planning processes had not been finalized, due in part to insufficient funds, but also to the lack of experience of World Bank staff in Central Asia (Sehring, 2002). Further funds were provided by the World Bank and the GEF in 1998, with a focus on technological improvements in the area of drinking water supply and irrigation.

Two major documents of the mid 1990's reorganised transboundary co-operation in water management, as well as the respective institutional settings:

- the 1995 Declaration on the Sustainable Development of the Aral Sea Basin (**Declaration of Nukus**), which secured the financial contributions to the ICAS and the IFAS. The declaration was signed by all Central Asian States, the World Bank and the United Nations. It stated in clear terms that the initially agreed financial contributions were not to be met by the countries. The Declaration acknowledged the over-exploitation of natural resources as the main cause for the Aral Sea crisis and its ecological and socio-economic consequences. The necessity of concrete measures, regional co-operation and a better information policy was clearly recognised. Concrete allocation targets and binding obligations are not stipulated in the Declaration.
- the 1996 agreement on the organisational structure of international basin organisations, establishing the interlinkages of the various organisations and aiming to streamline their areas of responsibility. IFAS, its Executive Committee, ICWC and its executive bodies, the Scientific Information Centre of ICWC, and the Basin Organisations (BVO Syrdarya and Amudarya) emerged as the main organisations in transboundary management regimes. ICAS was merged with the former IFAS, the executive functions for the ASBP.

Bilateral agreements



Several bilateral agreements supplement the multi-party agreement signed by all Central Asian republics. The most relevant is probably the 1996 bilateral agreement between Turkmenistan and Uzbekistan. This agreement reiterates the initial sharing agreement of 1987 for the water of the Amudarya below the river gauge at Kerki. Furthermore, these two countries maintain an agreement at the technical level on operating the transboundary drainage collectors, which originate in the Khorezm region in Uzbekistan and terminate in Turkmenistan.



3 Information management and exchange in the Amudarya Basin

In the process of transition from a command-and-control approach towards more adaptive solutions in water management, effective information management and exchange between institutions and stakeholders in transboundary river basins is regarded as a crucial prerequisite (among others Langaas and Timmerman, 2004). Nowadays, the Central Asian states also aim to apply the principles of Integrated Water Resource Management (IWRM) as a means for achieving better management results in terms of economic revenues, environmental balance, and social welfare. This chapter assesses the current challenges regarding information management in the Amudarya Basin. The first section gives an overview of the common understanding of information management in international law, as well as a description of general principles and benefits of effective information management in IWRM. The second section analyses the current approaches in information management from the perspective of Central Asian practitioners.

The analysis of current information-exchange practices is based on interviews conducted in May 2006 and in May 2007⁷ with Central Asian scientists involved in the water sector, as well as the results of a workshop on information exchange. The workshop was held in Urgench with scientists and practitioners in water management from Turkmenistan, Tajikistan and Uzbekistan, on May 30, 2006.

3.1 International provisions for information management in transboundary waters

The two main international conventions on transboundary watercourses - the *1992 UNECE Convention on the Protection and use of Transboundary Watercourses and International Lakes* and the *1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses* - have clearly pointed out the relevance of information management and exchange for the management of transboundary watercourses.

Article 6 of the 1992 UNECE Convention, "Exchange of Information", states:

"The Parties shall provide for the widest exchange of information, as early as possible, on issues covered by the provisions of this Convention."

The *1997 UN Convention on the Law of Non-navigational Uses of International Watercourses* is more precise in its provision on information exchange within transboundary watercourses. Even though it has not entered into force, it shall be included as an additional reference for our analysis.

According to the *UN Convention*, information exchange is a prerequisite for assuring that all riparian states are in the position to a) negotiate a fair and adequate share of the use of water resources and b) avoid significant damages beyond the borders.

Article 9 of the *UN Convention*, entitled "Regular Exchange of Data and Information", states:

1. Pursuant to Article 8, watercourse States shall on a regular basis exchange readily available data and information on the condition of the watercourse, in particular data of hydrological, meteorological, hydrogeological and ecological nature and related to the water quality, as well as related forecasts.
2. If a watercourse State is requested by another watercourse State to provide data or information that is not readily available, it shall employ its best efforts to comply

⁷ For a list of the interviewees refer to Annex I.



with the request but may condition its compliance upon payment by the requesting State of the reasonable costs of collecting and, where appropriate, processing such data or information.

3. Watercourse States shall employ their best efforts to collect and, where appropriate, to process data and information in a manner which facilitates its utilization by the other watercourse States to which it is communicated.

In addition, Article 8, on the general obligation to co-operate, sets wider prerequisites that have to be applied to information exchange practices as well. The article stipulates that “watercourse States shall co-operate on the basis of sovereign equality, territorial integrity, mutual benefit and good faith in order to attain optimal utilisation and adequate protection of an international watercourse.”

So far, of the riparian states of the Amudarya (Afghanistan, Tajikistan, Turkmenistan and Uzbekistan) only Uzbekistan has signed the two conventions cited. However, all the states recognise the principles of IWRM as means for meeting the challenges that the region’s water management faces.⁸

3.2 Principles of effective information exchange

Transboundary water management can be regarded as a cycle of processes where negotiation and implementation of international agreements alternate and are intertwined with processes at national and local levels. This cycle includes in the beginning a consensus of the involved parties to solve a problem through negotiations, or in case of significantly conflicting positions, to agree to a conflict-resolution process. The following negotiation discussions may lead to an interstate agreement or contract. In case this agreement or contract specifies the concrete implementation of measures, the agreement also needs to specify the burden that each party has to carry in the fulfilment of the proposed measures.

In each stage of these processes the involved parties need reliable information for well-founded decision-making on the one hand, and for effective implementation of measures on the other. A flow chart proposed by Grossmann (2005) illustrates the different information needs at each stage.

⁸ See Yalcin, R. (2005): *Governance, institutions and participation. Case study of the Amu Darya Basin, Uzbekistan Country report*. Contribution to NeWater Deliverable 1.2.1, and Kranz N., E. Interwies, A. Vorwerk (2005): *Transboundary Regimes in the Amudarya Basin*. Appendix to Deliverable 1.3.1 of the NeWater project, Berlin.

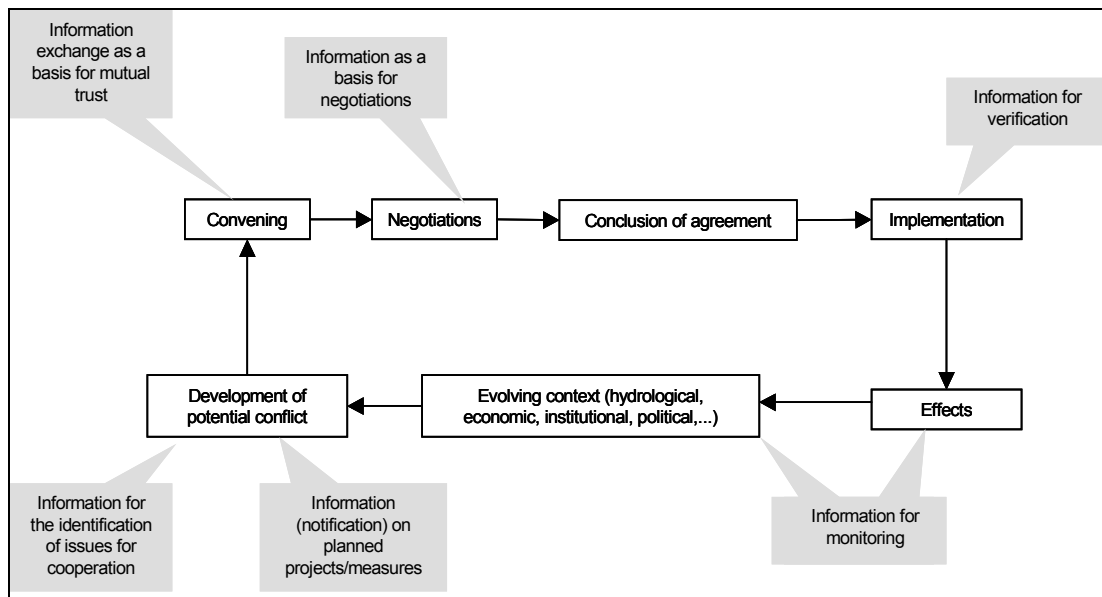


Figure 1: The role of information in the different stages of transboundary water management. Source: Grossmann (2005).

The overview shows that the type of information required at the different stages varies significantly. This is true for the level of detail of the information as well as for its content. In general, two main tasks can be identified in RBM: the management task and the operational task.

Management tasks comprise the strategic analysis of available water resources, as well as the strategic planning of water allocation, whereas the service units in water management (i.e. operational units) have to ascertain the construction and operation of water management infrastructure, and the operation of measurement devices and of networks for monitoring and forecasting. As a result, it has to be distinguished between information exchange needed for strategic analysis and planning, which sets the basis for transboundary negotiations, and the information exchange required for the operational maintenance of infrastructure and allocation regimes (Grossmann, 2005).

The information management cycle in Figure 1 implies that information generation and data processing needs to consider the specific requirements that are imposed by its relevant application.

Another important concern in transboundary information management and exchange is the accessibility of information to the parties involved. In the context of interstate negotiations, this will be regarded as a more political, and sometimes very sensitive, issue. The above cited international conventions call for free information exchange on all subjects related to transboundary water management, but national governments are often reluctant to provide this information. Two major issues in this regard are, firstly, the fear of losing winning-margins in negotiations, and, secondly, cost-recovery of information generation and data processing.⁹

The drawback of these strategies is that holding back information may produce significant disadvantages. In regard of the first concern, it can be observed that free access to information generates mutual trust among all the parties, which leads to a negotiation atmosphere where it is possible to generate new ideas and approaches. Sound information

⁹ T. Hannan, UNDP. Personal communication.



provision also provides the opportunity of mutual understanding of the specific concerns of the involved parties. In the end this is expected to aid in the development of agreements which are acceptable to all concerned.

In regard of the second issue, one should consider that lack of information could lead to inappropriate decisions that create noteworthy costs as a consequence, and/or other economic, social or environmental damages.

These different aspects of information management need to be considered in the analysis of information management practices in a transboundary river basin. In the Amudarya Basin, all stages of the water management cycle can be identified. The following section provides for a first analysis of how information management is applied in the Amudarya Basin at present.

3.3 Efforts towards effective information management and exchange in the Amudarya Basin

This chapter illustrates the current practices in information management in the Amudarya Basin. The first section gives an overview of the existing agreements or treaties among the riparian states of the Amudarya that are relevant to information management. In the second section, the most relevant institutions for information management at the transboundary level, as well as the latest efforts for the improvement of monitoring networks, are described shortly. The third section reflects the perspective of information management and exchange from the point of view of scientists and practitioners from Uzbekistan, Tajikistan and Turkmenistan.

3.3.1 Information exchange in interstate agreements and declarations – Provisions and Implementation

The importance of information management and exchange is reflected in the interstate agreement of 1992, the Nukus declaration of 1995, as well as the Dushanbe declaration of 2002. The most relevant in this context is the agreement of 1992,¹⁰ which provided for the re-organisation of the Interstate Coordination Water Commission of Central Asia (ICWC) and the Basin Water Organization “Amudarya” (BVO “Amudarya”),¹¹ originally established in 1987.

Article 5 of the 1992 agreement stipulates:

“The Parties shall facilitate wide information exchange on scientific-technical progress in water economy, complex use and protection of water resources, conducting joint research for scientific-technical support of problems and expertise in water related projects.”

These principles have been further specified in the Nukus declaration of 1995¹². In Chapter I, “*Adherence to principles of steady development*”, the creation of systems of information interchange on monitoring of the environment is provided. This provision was reconfirmed

¹⁰ *Agreement between the Republic of Kazakhstan, the Republic of Kyrgyzstan, the Republic of Uzbekistan, the Republic of Tajikistan and Turkmenistan on Cooperation in the Field of Joint Water Resources Management and Conservation of Interstate Sources*, adopted in Alma-Ata on February 18, 1992.

¹¹ For the institutional framework in the Amudarya Basin please refer to Kranz N., E. Interwies, A. Vorwerk (2005): *Transboundary Regimes in the Amudarya Basin*. Appendix to Deliverable 1.3.1 of the NeWater project, Berlin.

¹² *Nukus Declaration of the States of Central Asia and the International Organisations on Problems of Sustainable Development of the Aral Sea Basin*, Nukus, Uzbekistan. September 20, 1995.



again by the Dushanbe Declaration of 2002,¹³ which will “*improve monitoring and exchange of information systems between the countries on water and other natural resources situation with the purpose of making timely and correct decisions on their rational use*”.

Even if these declarations recall the requirements of international water law, the intended commitments, however, have basically remained on paper so far, without significant practical implications. In addition, they do not refer specifically to the individual river basins of Amudarya and Syrdarya, which would be more appropriate to address effective information exchange on the river basin scale.

Accordingly, the 2004 UNDP Strategy document on central Asia (often referred to as McCauley report)¹⁴ identified information management as one of the key water management issues in central Asia:

“Transboundary water management is constrained by limited, inaccurate and only weakly transparent information collection and analysis”.

According to the report, a viable and transparent information collection system is presently lacking in all transboundary river basins, including the Amudarya. This situation is exacerbated by a weak application (and understanding) of international watercourse law. The unfamiliarity with international legal provisions creates misperceptions and anxieties among government officials, which creates additional hurdles for the negotiation processes¹⁵.

Notwithstanding these limitations in transboundary agreements on information exchange, the central Asian governments are aware of the issue and additional efforts in this area are at least in a planning stage. An agreement of Central Asian governments, “*About Information Exchange and Database Establishing on Water Resources of the Transboundary Rivers of the Aral Sea Basin*” has been discussed since the late 1990s and is, according to the report of ICWC of December 2005¹⁶, still in the pipeline for approval¹⁷.

3.3.2 Actors in transboundary information management and exchange

As described in chapter 2.3, the key organisations in transboundary water management emerged in the course of a process over the past 15 years. The following sections aim to represent the current status in regard to information management and exchange.

3.3.2.1 Transboundary Organisations

The International Fund for saving the Aral Sea

The overarching institution in transboundary water management is the *International Fund for saving the Aral Sea* (IFAS). IFAS consists of several administrative bodies; in the context of information management and exchange, the most important are the Executive Committee,

¹³ *Dushanbe Declaration* of the States of Central Asia and the International Organisations to overcome the ecological and socio-economic crisis in the Aral Sea Basin and improve the ecological situation in the region. Dushanbe, October 6, 2002.

¹⁴ McCauley, David (2004): Strategy and Project Activities to Support Improved Regional Water Management in Central Asia, retrieved in the internet: http://europeandcis.undp.org/WaterWiki/images/5/53/UNDP-CA-Reg_Water_proposal_and_strategy_for_EU_clean.doc, 26. July 2006.

¹⁵ *Ibid.*, p. 8.

¹⁶ Prof. Victor Dukhovny, and Dr. Vadim Sokolov (2005): Asia and Pacific Sub-Region: Central Asia - CHALLENGES AND ACTIONS FOR INTEGRATED APPROACHES, document published in the framework of the preparatory process towards 4th WWF in Asia and Pacific region., to be retrieved in the internet at http://www.gwpcacena.org/en/pdf/ca_position_paper_eng.pdf.

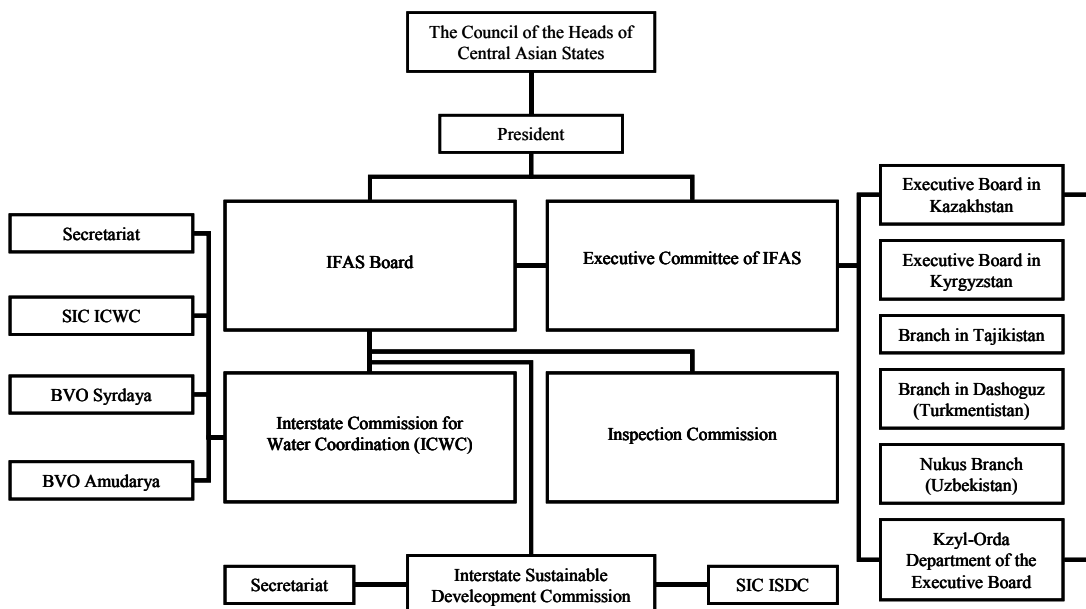
¹⁷ *Ibid.*, p. 10.



with its current office in Dushanbe, Tajikistan, and the Interstate Commission for Water Coordination (ICWC). Under the auspices of ICWC is also relocated the ICWC Scientific Information Centre and the BVO Amudarya.

IFAS is an organisation that implements the decisions of five Central Asian presidents. The overarching task of IFAS is to tackle the ecologic issue in the Aral Sea Basin (Kholmatov, pers. comm., 2007). The current set-up of the IFAS reflects the merger of the initial IFAS with the ICAS. The IFAS consists of the IFAS Board, composed of the Deputy Prime Ministers of the five states, and an Executive Committee, with two representatives of each riparian country, responsible for the implementation of the decisions adopted by the IFAS Board. The work of the IFAS is related to the management and co-ordination of the funding of projects and programmes in the Aral Sea basin. This activity involves liaising with the national branches of the IFAS as well as international organisations and donors, the implementation of projects, and the accumulation and allocation of funds. In this function, the ICWC also supports the activities of the IFAS (Kholmatov, pers. comm., 2007).

Fig. 1: Organisation Chart of the International Fund for saving the Aral Sea
(Source: IFAS 2004)



The ICWC fulfils a number of functions, the key responsibility of which is the development and co-ordination of annual consumption quotas for the riparian countries and the management of these allocations based on water availability. The ICWC furthermore operates and maintains the water abstraction facilities controlled by the BVOs. On a more strategic level, ICWC oversees the development of the regional water management policy, taking into account public as well as economic concerns, with the aim of increasing water availability in the region. In this function the ICWC also advises regional governments on pricing policies for water abstraction and the legal base for water use, and is in charge of large infrastructure construction and the introduction of water conservation technologies. ICWC is the key institution in the area of environmental monitoring and co-ordinates research in development in the water management field. Furthermore, the ICWC comprises the BVOs for the Amudarya and the Syrdarya, the ICWC Scientific Information Centre (SIC) and the ICWC Secretariat as executive bodies.

The BVO Amudarya, based in Urgench, Uzbekistan, is mainly responsible for overseeing the allocation of water, according to the quotas agreed for users in the basin. It also controls the



discharges to the Aral Sea and the operation of interstate reservoirs. Other tasks include the measurement of water levels, river flow assessment, the operation of canals, head gates and control facilities at inter-state structures, and also the design and engineering service of new water management equipment (UNECE/UNESCAP, 2004).

The Scientific Information Centre (SIC) was established under the auspices of ICWC (SIC-ICWC). The Centre derives from SANIRII (Central Asia Scientific Research Institute for Irrigation, Tashkent), but in 1980 special funding was allocated for the creation of a framework on the infrastructure of the body (Dukhovny, pers. comm., 2007).

The SIC provides for scientific training as well as scientific research relevant for water management in the Aral Sea Basin. Complementary to the centre's own website, an information portal¹⁸ for water and environmental issues in Central Asia has been set up within the framework of the Central Asia Regional Water Information Base project (CAREWIB), funded by the Swiss Agency for Development and Cooperation, and implemented by SIC-ICWC jointly with the UNECE and UNEP/GRID-Arendal. This Internet portal provides on-line databases, publications and extensive link lists (Sokolov, pers. comm., 2007).

Regional Centre of Hydrology (RCH)

The RCH in Dushanbe, Tajikistan, was created in 2002 in order to assess the water resources of the Aral Sea Basin. The centre was established with support of the Swiss Agency for Development and Cooperation (SDC). In 1996 it was first established in Tashkent with regional offices in Almaty and Dushanbe. The RCH's work centres exclusively on hydrology; they provide forecasts for the water flow for the Aral Sea Basin.

The RCH processes satellite data and primary data on the water level provided by the national Hydromets. The satellite Noah provides data which the RCH staff processes for the water flow forecasts. Additional satellite data is provided by the Hydromets in Almaty and Tashkent. The RCH office receives the primary data on the water level in both electronic (e-mail) and hard-copy format on a daily basis (Minikulov, pers. comm., 2007).

The RCH issues and publishes an annual report on water flow that is available both in digital form and as hard copy. The main users of these reports in Tajikistan are the energy sector and the Ministry of Water Management; in addition, foreign investors also find this data useful. In the past these reports were directly sent to the Ministry; nowadays they are only in display at the RCH office.

The data is made available on a monthly basis. The RCH has agreements/contracts with both BWO Amudarya and Syrdarya. The monthly data is combined with the measurement of the outposts. All the data provides the calculation on the annual water flow. The BWO doesn't have own measurement posts: all data is provided by the Hydromets. The regional centre combines the data from the national Hydromets.

The work of the RCH is challenged due to political reasons. The Hydromets do not always provide their data on a regular basis (Minikulov, pers. comm., 2007). The reasons for this irregularity seem to be manifold: in some interviews it was insinuated that the cost-recovery of data provision to other institutions is not always met. Another assumption of the authors is that the set-up of the RCH in Tajikistan may have led to rivalry, considering the fact that the national Hydromets are carrying out similar work and research.

On the interstate level there is no direct exchange between the RCH and the ICWC; however, the RCH is informed about the activities of ICWC (particularly for the ICWC-SIC) and vice-versa.

¹⁸

www.cawater-info.net



The programme of the Swiss SDC also includes training of the national Hydromets, including BWO staff.

3.3.2.2 National hydrometeorological services

Important actors in transboundary information management and exchange are the national hydrometeorological services (Hydromets). All riparian states of the Amudarya operate a national Hydromet, which belong to the international network of hydrometeorological services under the auspices of the World Meteorological Organisation (WMO) (Homidov, pers. comm., 2007). The task of the Hydromets is to collect and to process hydrometeorological data and the monitoring of this data.

Under the Soviet Union, the five Hydromets of the Central Asian Soviet Republics maintained a special “*headquarter*” based in Tashkent, Uzbekistan. This central Hydromet was responsible for the unified database of the Aral Sea Basin. After independence of the Central Asian states the central Hydromet was abolished (Homidov, pers. comm., 2006). Today the national Hydromets view the possible establishment of a centralised unified database in negative terms; they prefer to keep control of their equipment and data. It is assumed that a central Hydromet would not contribute to the conservation of the data collection system (Yakovlev, pers. comm., 2007).

Today, bilateral agreements are the legal basis for data exchange among the Hydromets. The past years have seen intense discussions regarding the most efficient co-operation of the hydrometeorological services, but so far the bilateral approach to co-operation and exchange has been the most effective, and on the basis of these agreements the Hydromets are freely exchanging data and information. These agreements, however, include restrictions to the use of the data: the Hydromets are not allowed to pass on the data received to third parties. In addition, in case of any form of publication the source of data always has to be stated. Currently there is no exchange of information with the Afghan Hydromet service; the remaining five Hydromets of the Aral Sea basin have established quite a good co-operation. Currently they are steaming for the development of a unified data collecting system. The Hydromets of Kazakhstan and Uzbekistan are technically more advanced; joint efforts have been set up to provide training for the other Hydromets in the region (Yakovlev, pers. comm., 2007). Concerning the issue of technical upgrade of the national Hydromets, attention should be given to the issue of compatibility with existing equipment. In Kyrgyzstan there is an institute for the certification of technical equipment (Abdukayumov, pers. comm., 2007). Russian equipment is preferable, because it is compatible with old Soviet techniques and the Hydromets’ staff is trained to use these techniques. The Hydromets used to be very standardised institutes and it would be good to maintain this (Yakovlev, pers. comm., 2007).

The national hydromets are state-owned institutes and receive national funding. The Uzbek Hydromet, for example, is funded to 90% by the Uzbek government; the remaining 10% are funded through revenues from services provided to third parties (Yakovlev, pers. comm., 2007).

In Tajikistan the data on the water level is in most cases measured manually. Automatic measuring posts also exist, but the connection for the data transfer is scarce and the costs are too high. In the past the SDC sponsored the funding required (of 300 US \$); today they would have to find other funds. In addition, measuring is highly difficult in the mountainous regions: there are no techniques that are suitable for the mountains. An additional issue is that measuring equipment can only measure water levels, but not the uses given to water, and the staff’s level of experience must be very high. In Tajikistan, for example, the Hydromet currently counts with 96 observers. The Hydromet recently became part of the Ministry of Water Management. Not all data produced is compatible, in Tajikistan they would need approx. 500 stations. In Soviet times 157 stations existed (Minikulov, pers. comm., 2007).



On the technical level, efforts have been made to improve the network of monitoring and measurement devices, which has deteriorated dramatically since independence of the five Central Asian states. With support of mainly the Swiss Agency for Development and USAID, new devices have been installed and equipment for modern computerised data processing has been procured. Nevertheless, in the face of the severe breakdown of the monitoring systems of Soviet times, these efforts have remained fragmented and incomplete.¹⁹

The Swiss also plan to install new hydroposts, especially at the Afghan/Tajik/Turkmen border. At the moment, however, this is proving increasingly difficult, because all governments have to agree on the matter. At the existing posts in the border region between Turkmenistan and Uzbekistan staff of both countries' take measurements together (Tillyavova, Gulnara, BWO, pers. comm., 2007)

Box: Initiative of the Tajik Hydromet for improving information management and exchange

In summer 2006, on initiative of Tajik Hydromet, the Tajik government launched a „*Programme of the hydrometeorological stations and posts' reconstruction for 2007-2016*“. The programme aims at a complete reconstruction of the hydrometeorological services in Tajikistan. Estimated costs for the realisation of this programme come up to 7 million US \$. The Tajik government committed considerable funds to the programme, covering about 40% of the total amount. The remaining funding shall be covered by the contributions of various donor organisations.

The programme includes:

- hydrometeorological network reconstruction;
- enhancement of the hydrometeorological and services quality, implementation of the obligations in area of hydrometeorology derived from international agreements and resolutions adopted by the Republic of Tajikistan;
- development of a method system to predict natural disasters and extreme weather events (i.e. mudflows, avalanches, heavy rainfalls, hail-storms, floods, heavy winds, droughts, etc.);
- improvement of the early-warning notification system;
- improvement of the provision of hydrometeorological information;
- broadening and enlargement of the providing area;
- improvement of the observation system, of the climate and climate change assessments, and integration into the Global Climate Observation System (GCOS) and Surface Land Hydrology Global Observation Network.²⁰

3.3.3 Current challenges in information management and exchange practices

The experts interviewed in the region highlighted the importance of the legal basis for information exchange and the technical problems in the collection and processing of data as main factors in information management practices. In addition, a highly challenging issue is that of water quality, which has so far hardly been addressed in the Amudarya basin.

¹⁹ Homidov, Anvar, Tajikistan, Hydrometeorology agency, personal communication (2006)

²⁰ Homidov, Anvar, Tajikistan, Hydrometeorology agency, personal communication (2007)



A topic that was not explicitly discussed by the participants of the workshop or by the interviewees is the question if the existing information presents a suitable basis for decision-making and for the operational tasks of water management at the transboundary scale. This question points to a high risk in information management. Decisions should to be approved by facts (Wilson, pers. comm., 2007). Due to the fact that at the transboundary scale representatives of different governments are involved, it will be hard to create an atmosphere of trust and openness among the negotiating parties if information in this context is not accurate. Therefore, the technical issue of providing information could become a sensitive political issue in transboundary negotiations.

Information of transboundary relevance

Information regarding water quantity remains an important issue, because this data is needed for water allocation schemes. However, other issues of importance for water management seem to have been neglected in the past. Even when considering water quantity, not every aspect is satisfactorily covered. This includes measurements of precipitation, monitoring of glaciers, and the assessment of water intake units. Meteorological parameters also play an important role, especially if factors such as climate change will have to be considered in future water management planning (Normatov, pers. comm., 2007).

Water quality information such as chemical analyses, in particular regarding pollutants, was widely considered relevant at the transboundary scale.

An early warning system for floods and droughts would be a major requirement, especially in the context of the security of infrastructure of water resource reservoirs and dam safety (results of workshop discussion in Urgench, May 2006).

Main issues in information exchange

The existence of reliable agreements that provide guidance on how information exchange should take place was considered important for transboundary water management. The distribution of burdens (costs) for the generation and processing of data should be better addressed. The Hydromet services face significant shortage of funds, as well as of equipment and personnel. Hydromet services should have improved access to institutional funding (results of workshop discussion in Urgench, May 2006). Another big issue – almost ignored so far – is the integration of water quality issues in decision-making. Reliable instrumentation for the measurement of water quality is still lacking; in addition, the ecological aspects of water resources, such as effects of changes in the groundwater table on ecosystems, are not sufficiently incorporated in water management plans and decision making (Homidov, pers. comm., 2006).

With regard to technical provisions in the field of information exchange, measurements should be carried out with an even distribution across the basin. Data should be comparable; methods, equipment and data should be reliable, complete and provided in a timely manner. In addition, data and information should be accessible and transparent to the parties involved. Attention should also be given to the terminology regarding methods and results; ideally it would be the same for the whole basin. So far none of these points has been fully implemented. Especially the issue of data quality (e.g. reliability, comparability and timeliness) has been intensively discussed and has been identified as one of the most pressing challenges in the Amudarya Basin. Many projects that address data collection and data management exist, but the co-ordination of these is insufficient (results of workshop discussion in Urgench, May 2006).

How is information exchanged among Hydromet services?

Notwithstanding the computerised systems which have been set up in some parts of the basin, the most reliable methods of data transmission are still the traditional ones, via phone, radio or in printed format. Electronic transmission of data is still in an early phase and not



working very well so far. In this context it is very unfortunate that the meteorological yearbook is not being published anymore (Homidov, pers. comm., 2006).

The reduction in the number of Hydromet monitoring stations since the independence of the Central Asian states is critical (Homidov, pers. comm., 2006). Information exchange on water quality occurs only on the national level. The information exchange on regional level, limited to water quantity, is organised by Hydromets on the basis of bilateral contracts.

Problems to be addressed

The lack of a legislative basis for co-operation is considered an important problem (results of workshop discussion in Urgench, May 2006). The other main problem would be information quality. Different reasons were mentioned for the quality problems. The main one would be that equipment is outdated and insufficient in number: the number of monitoring stations (hydroposts) was reduced from 45 stations in Soviet times to 17 existing today (May 2006). A GEF project on rehabilitation of measuring posts has restructured the monitoring stations in the Amudarya Basin; nevertheless this initiative is far from sufficient. In addition, there are no portable laboratories available for specific analysis, and the general support is not sufficient, both regarding technical aspects and personnel (results of workshop discussion in Urgench, May 2006).

Another reason for the difficulties in information management is that measurements in border areas are complicated and/or dangerous, and therefore not feasible. This is especially valid for the Tajik-Afghan border, where specific agreements for co-operation on hydrological research still do not exist.

In a few cases overlaps of competence occur. For example, the Ministry of Agriculture and the State Committee for Nature Protection in Turkmenistan share two monitoring stations, and it is not clear who is measuring what. Co-operation between the operational staff of hydroposts is also difficult because of complicated border regulations, e.g. regarding passports and visas (results of workshop discussion in Urgench, May 2006).

The water quality issue should be addressed at the basin level; an interstate institution that deals with this matter is missing.

Monitoring of glaciers is insufficient, but also very expensive. Tajik and Uzbek Hydromets try to co-operate in this area (Homidov, pers. comm., 2006).

A centralised institution is lacking in the Amudarya that provides forecasts of water flow for the entire basin. There is also no (or insufficient) information exchange between Hydromets on water flow forecasts.



4 Donor involvement in transboundary water management in the Amudarya Basin

The second focus of NeWater research on transboundary water resource management in the Amudarya is the involvement of donor organisations. Many of the world's transboundary river basins are dependent on the support of donor organisation for providing the financial resources required for RBM. But donor organisations' activities are not limited to the provision of financial support: these often include substantial consultancy activities, and donors also follow their own policy agendas. As a consequence, donors are able to provide significant impulse to IWRM, but the results of their activities can be less than positive if donor efforts are not co-ordinated and actions turn out to be contradictory or counterproductive.

In the Amudarya Basin, multilateral and bilateral donor agencies entered the scene in 1991. The experiences of these years show that donors can play a crucial role in transition processes; in consequence, there are huge possibilities for donor organisations playing an important role in transition processes towards more adaptiveness. This was the rationale behind our choosing this focus in collaboration with our counterparts in Central Asia.

The first section looks back to past experiences of donor involvement in transboundary water management. The second section depicts current donor approaches, and will address three main foci as identified in the course of the field research:

1. strengthening national water policies,
2. a new Amudarya Basin agreement,
3. supra-regional co-operation and discourses.

The fourth section describes initiatives for better co-ordination.

4.1 Donor involvement in the Amudarya basin – past experiences

International donor organisations constitute a central actor in transboundary water management in Central Asia. Most visible here are the World Bank, UNDP and UNEP, the Asian Development Bank, the US Agency for International Development (USAID), several national development agencies (e.g. Switzerland and Canada), as well as the EU-TACIS²¹ programme.

After the independence of the Central Asian states, international donors assumed a very prominent role in shaping the international water management process in the region, engaging not only in the financing and enabling of concrete projects, but also facilitating the consolidation of institutions for transboundary water management and the design of international agreements on shared water resources.²² The international organisations were instrumental in keeping up the momentum in the efforts to foster cooperation among the riparian states and reducing mistrust and tensions among the key players. The fact that meetings, conferences and joint agreements are now being initiated by the states themselves is considered as a success of the involvement of these organisations. Furthermore, the intervention of the international donors lead to the broadening of the 'negotiation set' to

²¹ Technical Assistance to the Commonwealth of Independent States (TACIS).

²² TACIS funded a program to support the drafting of water sharing agreements through the organization of training activities, the establishment of working groups and the provision of advice on international water law.



include energy issues, thus ensuring that upstream countries would not divert the watercourses for their own uses.

The Aral Sea crisis led to a broad variety of donor-supported activities after the independence of the five Central Asian States. Major programmes in this context include the Aral Sea Basin Programme (ASBP) Phase I, which started in 1994, and the Water and Environmental Management Project (WEMP), as of 1998, in support of measures under the ASBP I. The ambitious aim of these projects and programmes, to cover almost every issue in water management in the Aral Sea Basin, faced significant challenges that to a considerable degree were not to be overcome. Main factors for unsatisfactory compliance have been:

- the complexity of the Aral Sea crisis;
- weak project management and donor co-ordination;
- reluctance of the concerned Central Asian states to arrive at effective interstate agreements;
- achievements of the programmes were limited due to lack in co-operation among the Central Asian states (Hannan, pers. comm., 2006).

As a consequence, by the end of the 1990s donor efforts had shifted to addressing water management issues with clear targets, preferably on the national or even local level, such as reconstruction of water management infrastructure, technical support for monitoring devices, wetlands restoration, or poverty alleviation and population healthcare.

In 2002, a second Aral Sea Basin Programme (ASBP-2) was approved by IFAS. According to the 2005 ICWC report, however, two years after approval the joint financial support and commitment of the states and international donors only cover five percent of the programme's requirements.

At present the transboundary perspective of water management in the Aral Sea Basin is again receiving growing interest of the international donor community. On the one hand, this is due to the fact that without transboundary co-operation the heritage of severe mismanagement in Soviet times, the increased pressure on the quality of water resources, and the growing conflicts in the allocation of water resources cannot be addressed. On the other hand, a change in donor attitude may have occurred, placing more emphasis on adapted and tailored approaches which use a step-by-step approach rather than aiming for one-fits-all solutions.

Still, national approaches to donor involvement continue to constitute an important framework for co-operation for most donor organisations. This is on the one hand due to the fact that dealing with single government structures is still much easier and promises far more perspectives for success than complicated interstate projects. On the other hand, there are several donor organisations that only develop national strategies and do not have an own regional strategy for central Asia²³.

4.2 Current approaches of donor organisations to transboundary water management

This section reflects the current status of research conducted in the framework of the NeWater project. Rather than reassembling the single perspectives of donor organisations, this chapter outlines the currently prevailing approaches to donor support in transboundary water management. Representatives of major donor organisations were interviewed in Tajikistan, Turkmenistan and Uzbekistan.

²³ R. Abdukayumov, ADB. Personal communication.



The disappointing achievements of the Aral Sea Basin Programme resulted in the disenchantment of the donor community active in Central Asia. At the end of the 1990's most donor organisations revised their policies and scaled down their expectations (Wilson, pers. comm., 2007). The main lessons learned in the first decade of donor involvement in the Aral Sea Basin can be summarised as follows:

- The complexity of the issues in water management had been underestimated; correspondingly, expectations were much too large (Wilson, pers. comm., 2007).
- The transboundary component of the ASBP did not have a good foundation in stringent and balanced national policies, nor was there a sufficient understanding of the implications of international water law (Hannan, pers. comm., 2006).
- Unsufficient ownership of the Central Asian governments due to predominantly donor driven approaches (Nasriddinov, pers. comm., 2006; similarly Abdukayumov, pers. comm., 2006).
- Doubling of efforts and contradictory involvement of the different donor organisations was counter-productive; this was also due to insufficient dissemination of lessons learnt from past projects (Petrov, pers. comm., 2007).
- Emerging challenges from other sectors such as the energy sector, as well as socio-economic issues, were neglected in the past (Wilson, pers. comm., 2007).
- Incoherent and ineffective interstate institutions as well as unclear and vague provisions in the basin agreements resulted in weak management and competition among administrative bodies (Abdukayumov, pers. comm., 2006; similarly Khoshmukhamedov, pers. comm., 2007).
- Lack of transparency in the allocation of funds led to mistrust among the involved parties (Hannan, pers. comm., 2006).
- Lack of adequate control mechanisms to assure the sustainability of funds provided (Petrov, pers. comm., 2007; similarly Dukhovny, pers. comm., 2007).

The observations made by the interviewees are also reflected in official ODA strategies of donor organisations such as the UNDP regional strategy for Central Asia (also known as the 2004 McCauley Report).

As a consequence of these assessments, the donor community has significantly diversified their policies and approaches. In spite of prevailing delusive results, some positive achievements can be retrieved from past experiences. The efforts of the past fifteen years had as result an important amount of sound scientific research, and have also resulted in very significant databases. The WARMAP and the WARMIS projects are two examples among others that provide a good basis for future efforts. The question that remains however is to what extent these databases are accessible for scientists and decision-makers across the basin and beyond. Only a widely accessible database will make a considerable contribution towards more adaptive water management.

Current donor efforts concentrate on supporting the upgrading of technical infrastructure. The World Bank for example is currently assisting a water sector inventory of all water infrastructure in the Aral Sea Basin, and has plans to present an investment strategy on the modernisation of the irrigation and drainage system (Abdukayumov, pers. comm., 2007). Another example is the Swiss programme supporting the technical infrastructure of the Hydromet network (refer to section on information management and exchange).



On another front, initiatives are increasingly aiming at the achievement of strategic goals. Three main identified foci will be subject to a more detailed analysis in the following sections:

- strengthening national water policies,
- a New Amudarya Basin Agreement,
- supra-regional Co-operation and Discourses.

It should be emphasised that each of these foci is not solely donor driven. On the contrary, one of the main lessons learnt from the past was that the initiative for new actions should derive from the countries and governments themselves.

4.2.1 Strengthening national water policies

The first Central Asian strategy on IWRM was developed by the Kazakh Government with support of UNDP Kazakhstan. Currently Kazakhstan is collecting first experiences with the implementation of the strategy. Technically more advanced in comparison to the remaining Central Asian countries, Kazakhstan could play a leading role in the development of new approaches to water management in the region (Wilson, Yakovlev, Anwar, Khoshmukhamedov, all pers. comm., 2007). In order to provide a better understanding of the actual political background for each country, the current status of water management and the most important issues are briefly described.

As a general note it should be pointed out that the water management approach in all Central Asian states was transformed significantly after the collapse of the Soviet Union, and that the development of new structures has been different in each of the countries. The form the development of new structures took was dependent on the specific political and social pressures, as well as the specific economic conditions in each of the Central Asian states.

4.2.1.1 Afghanistan

Due to the political instability of the country due to the war, there is little information available concerning water management in Afghanistan. It is estimated, however, that Afghanistan will extend the use of water resources of the tributaries to the Amudarya.

Both hydropower and the extension of irrigated agriculture are currently on the agenda of Afghan projections for the Amudarya (Ahmad and Wasiq, 2004). The Afghan Minister of Energy and Water, Ismail Khan, announced that in future Afghanistan will irrigate 1 million ha in the Amudarya Basin. In Soviet times, 11 km³ of water were allocated to Afghanistan; this amount will not be sufficient for this purpose (Kholmatov, pers. comm., 2007). The main problem in this respect will be the restoration and further development of the irrigation infrastructure (Berkeliev, pers. comm., 2007). However, Afghanistan has the advantage of counting with the attention of the international community, and thus disposes of significant basic funding (Wilson, pers. comm. 2007).

In consequence, the inclusion of Afghanistan in current negotiation processes is of utmost importance. Soviet and Central Asian specialists from Moscow accomplished a lot of useful research on Afghanistan that could be useful for future development (Berkeliev, pers. comm. 2007).

4.2.1.2 Tajikistan

Background

Tajik water management is overseen by the Ministry of Water Management as the main authority, and governed by the National Water Code of 2000. The Code gives priority to economic mechanisms for regulating water uses, specifically licenses and charges for water supply. One of the main issues impacting the economic development of Tajikistan is the



shortage of arable land and as a consequence an unstable food security; most policy efforts are directed at this problem. Tajikistan's main agricultural production areas lie in the irrigated valley of the Syrdarya and the Amudarya, and the Tajik government intends to increase the amount of irrigated land by 350,000 ha by 2010. With the new Water Code, it is now possible to transfer irrigation schemes to the private sector; however, no legislation exists which addresses the granting of water rights, in particular with view to the operation of irrigation schemes (Khoshmukhamedov, pers. comm., 2007).

Tajikistan has largely abolished state control in agricultural matters, as well as eliminating price controls. Water user associations have been established to control intra-farm irrigation systems. In Soviet times, the development of irrigated land had been limited in Tajikistan in favour of downstream areas of the basin, resulting in a water allocation which did not address the needs of the country.

While this situation generates repercussions at the international level, it also needs to be considered in conjunction with the further expansion of hydropower infrastructure and the pollution prevention in transboundary waters (UNECE/UNESCAP, 2004). In accordance, Tajikistan is strongly lobbying for the better integration of the water and energy sectors at the regional level (McKinney, 2003).

The Tajik Water Sector Development Strategy

The most recent document in the field of water management is the Tajik Water Sector Development Strategy. The strategy was mainly initiated by the government and developed despite very limited available funding. UNDP facilitated the preparation of the strategy on request of the government, with the support of some experts. The timely implementation of the strategy will be a challenge. While the strategy does not provide for concrete steps for implementation of measures (which an action plan would do), it gives an overview of the current situation in the water sector and sets the guiding principles with which future action and management plans should align. The next step foreseen by the strategy is the preparation of an action plan. Water and sanitation is a priority for Tajikistan: only 43% of the population has piped water. The water sector strategy can be understood as an outline of what needs to be done in the water sector, but it also gives guidance to possible and even desirable future developments that are at present still far from becoming reality (Khoshmukhamedov, pers. comm., 2007).

The Tajik water sector strategy is strongly interlinked with energy issues. Tajikistan needs more storage capacity, but dams could produce substantial conflicts with the neighbouring countries such as Uzbekistan. Tajikistan has plans to build and/or enlarge the Rogun and Nurek water reservoirs. One of the major issues threatening the realisation of these dams is the absence of sufficient funding (Khoshmukhamedov, pers. comm., 2007).

However, finding sufficient funds is not the only issue Tajikistan has to address. Another issue to consider is that due to the location in a very mountainous area the connection of power lines for the transport of the produced electricity is not that easy. In some areas for example they would have to build power supply lines through Uzbek territory, so as to provide electricity to their own country. Another point is related to the possibility of selling electricity (maybe even to China). Tajikistan is advised to carefully consider this option, especially with regards to China as a potential client. This might change the dynamics in the region significantly and also impact the already tense relations with its neighboring countries.

The Tajik Water Sector Development Strategy was a follow-up of the two international conferences held in Dushanbe in 2003 and 2005:



- the Dushanbe Freshwater Forum 2003, supported by the Aga Khan Foundation²⁴, and
- the Transboundary Water Conference 2005²⁵.

Tajikistan, which possesses 4% of the world's stock of freshwater, is important to the world's freshwater resources. In consideration of this responsibility Tajikistan signed the Act on Water, Irrigation and Hydropower in Johannesburg, South Africa, on occasion of the World Summit on Sustainable Development in 2002 (Kholmatov, pers. comm., 2007).

Water management in Tajikistan, however, also underlies significant institutional threats. Currently a top-down approach prevails in the country. Decisions often have to be taken at the highest political level of the cabinet of ministers. The day-to-day practice, however, often requires faster decision-making; in addition, this decision-making should be closer to the actual management level (Petrov, pers. comm., 2007).

4.2.1.3 Turkmenistan

Turkmenistan is providing markedly less input into regional co-operation in Central Asia, and is focusing much more on its relations with the Caucasus, the Middle East, Iran and Caspian Sea riparian states. As a consequence, Turkmenistan mostly acts as an observer to Central Asian co-operation agreements and refuses to take part in regional water management schemes (McKinney, 2003).

In Turkmenistan the water sector is still largely state-controlled and dominated by a single administrative body, which oversees all areas of water management ranging from municipal water supply and sanitation to irrigation and hydropower generation. Irrigated land currently amounts to 1.86 million ha, and it is expected to reach 2.2 million ha by 2010. Major water resources are drawn from the Amudarya. Up to a certain limit irrigation is provided free of charge. A major issue in Turkmenistan is agricultural run-off, causing downstream pollution with major impacts on drinking water quality. This issue is also a subject that generates bilateral tension between Uzbekistan and Turkmenistan (Esenov, pers. comm., 2007).

In order to meet the problem of degrading water quality in the wake of environmental pollution, Turkmenistan has proposed the development of an international agreement on the quality of transboundary waters for the Amudarya basin (UNECE/UNESCAP, 2004). This proposal goes back to a programme on water quality assessment of the Amudarya waters, launched by UNDP and finalised in 2004. The results of this assessment were alarming: particularly the water coming from Afghanistan is very polluted (Nurmuhamedov, pers. comm., 2007).

On the basis of this assessment, a proposal for a nation-wide set-up of a water quality monitoring system is currently doing the rounds. The Ministry for Water Economics already endorsed the programme; they are currently looking for sufficient donor support (ibid.).

In September 2004 a national water law was endorsed. This law also includes provisions for transboundary water management issues by stating that each international document approved by the Turkmen Government stands above the national law and is directly binding (Saparov, pers. comm., 2007).

Major challenges in the water sector are water and soil salinisation, gaps in the educational system and scientific research (Wilson, pers. comm., 2007).

In the past the drainage water of irrigated lands was often directed to desert lowlands, where a redirection to the water system appeared to be too expensive. In addition, the specific soil

²⁴ For more information refer to the website <http://www.freshwaterforum.org/index-eng.htm>.

²⁵ For more information refer to the website <http://www.transwaterconference2005.org/english/about.htm>



chemistry of the Central Asia sand soils is very favourable to severe salinisation problems. As a result, a significant proportion of arable land has been lost (Wilson, pers. comm., 2007).

In order to tackle the problem of water discharge in the desert, the Turkmen Government is planning to direct all drainage waters of Turkmenistan to an artificial Lake in the North of the country, called “Golden Age Lake”. A second purpose of the collection of drainage water is that those water discharges with a lower salinity gradient could be reused in regions with increasing water shortages (Esenov, pers. comm., 2007).

A second approach to tackle the increasing environmental degradation in the agricultural sector is to foster education and training of Turkmen scientists. Under the new President Gurbanguly Berdymukhammedov, a high-level group of key scientists was created under the Academy of Science. Within this group of around 65-85 people the remaining contacts to scientists in Russia will be reactivated in order to gain new access to the international research community. Russia is the ideal partner for scientific exchange, firstly because Russian language is still widespread in the Turkmen scientific community. Secondly, Russian science has a very similar history; as a consequence, educational systems and research approaches are highly compatible with the Turkmen ones (Wilson, pers. comm., 2007).

Also in terms of training and education new initiatives are coming up. While training should be targeted at the highest political level, research should address the bottom-up facts that are needed for high-level decision making. The historical background in this context is important, even if a lot of the data is already outdated (Wilson, pers. comm., 2007). Also quality assessments of present methods in data collection and processing would be beneficial (Berkeliev, pers. comm., 2007).

4.2.1.4 Uzbekistan

Water management and its interrelation with agriculture and energy are key policy areas in Uzbekistan, since the country depends heavily on irrigation agriculture and for a large part on transboundary water resources for this irrigation. Several national action programmes have been devised in the past years, mapping out strategies for the key areas of water management (drinking water quality, water supply, and groundwater protection). In restructuring its water sector, Uzbekistan follows a differentiated approach for the various water uses. There is, however, a generally strong tendency towards privatisation which includes the irrigation sector, even though massive subsidies are still maintained at the current stage.

Uzbekistan is ridden by a number of concerns in relation to transboundary water resources, and thus very active in pursuing the furthering of regional co-operation with its neighbouring countries. Furthermore, the country advocates the compliance with international agreements among the riparian countries, and monitors closely the effectiveness of the Interstate Coordination Water Commission of Central Asia (ICWC). On a more technical level, Uzbekistan aims for cooperative agreement on the operation of primarily three transboundary reservoirs: Toktogul (in Kyrgyzstan), Kayrakum and Nurek (both in Tajikistan). These are managed by the respective neighboring country, but represent important reservoirs for Uzbekistan.

Uzbek government officials additionally lobby intensively for the improvement of the information systems for water management, as well as their extension to include water quality issues (McKinney, 2003). To what extent Uzbekistan or any of the riparian countries is willing to comply with such requirements should they be introduced remains to be seen.

In order to tackle the increasing threat of water scarcity, a special department has been established under the Cabinet of Ministers. Representatives of the state-owned stockholder company Uzbek Energo (the former Ministry of Energy), the Ministry of Water Management



(MinSelVodkhoz) and the Uzbek Hydromet take part in this department. The aim of this department is to develop a strategy for the transition to a water-saving regime (Yakovlev, pers. comm., 2007).

One major concern for Uzbekistan is the provision of water for the Kashkadarya and Surkhandarya regions. Due to altitude differences water has to be pumped up from the Amudarya, with the pumping station located on the territory of Turkmenistan. Uzbekistan and Turkmenistan still have no control mechanisms for the effective water allocation at this pumping station that is satisfactory for both parties (Siradjitdinov, pers. comm., 2007).

The National Strategy on IWRM for Uzbekistan

With support of the UNDP Country Office in Uzbekistan, the Uzbek Government is in the process of reforming its national water policies.

In terms of IWRM, UNDP currently supports the preparation of two strategic documents:

- Publication on water resources and the water sector in March 2007.
- Elaboration of an Uzbekistan IWRM national strategy, which will be prepared under the auspices of the Ministry of Agriculture and Water Resources.

In March 2007 the Uzbek government, in co-operation with UNDP Tashkent, issued a review on current water management in Uzbekistan. This review will be the starting point for the development of a National Strategy on Sustainable Water Resource Management for Uzbekistan. The elaboration of such a strategy is currently under preparation (Abdullaev, pers. comm., 2007). The strategy will give guidance to IWRM in Uzbekistan for the following 25 years. In the first phase of development of the strategy, 6 to 8 months of stakeholder consultation will be needed. The project for the strategy development will last at least three years. It shall provide a knowledge platform and provide reforms for the whole water sector. The Kazakh government has already finalised its national strategy, which could serve as a role model for the Uzbek case. The Ministry of Agriculture will take the lead in the development of the strategy (Nasritdinov, pers. comm., 2007).

The objective of UNDP assistance is to gain the full commitment of the Uzbek government to IWRM principles; it is therefore carefully taking into consideration the Uzbek government's needs and concerns. Donor interests often reflect water users' needs; the Uzbek government, however, also has to think about its revenues (ibid.).

At the moment the Uzbek government is very reluctant to address transboundary concerns in water management: they tend to prioritise short-term benefits and are more interested in immediate results. Water management in Uzbekistan is a very complex issue that requires the integration of many different sectors, organisations and stakeholders. Measures supported by donor organisations, however, have to be authorised from the upper echelons of the government, to ensure that the efforts will not be hampered by political infighting between different levels of authority. The elaboration of the national strategy on IWRM will serve both objectives: to commit the Uzbek government to IWRM principles and to strengthen capacity-building in the country. In a long-term perspective, this strategy may also involve the Uzbek government more extensively than before in transboundary water issues (Nasritdinov, pers. comm., 2007).

In this regard special emphasis will be placed on capacity building in international water law and the principles of IWRM. Other aspects addressed are the strengthening of institutions and the elaboration of national water management strategies. The latter also fulfil an important function in the context of transboundary water management. Interstate negotiations have been problematic simply because participants have not been clear about their own positions. National strategies provide clear outlines of priority issues in national



policies. Especially issues like water quality, which have been neglected in the past, will be better understood by decision-makers if they are fully aware of the situation and perspective in their own country (Hannan, pers. comm., 2006).

4.2.2 A New Amudarya Basin Agreement

The incoherence and weak provisions of the existing interstate agreements in the water sector of the Aral Sea Basin motivated a reorganisation of the international water law of the region. The Asian Development Bank (ADB) offered support in facilitating the negotiation processes; the process was initiated in the Syrdarya Basin, and later on, when a first draft of the Syrdarya Agreement had been developed, the same process was started in the Amudarya Basin.

Currently all water in the Aral Sea Basin is distributed on the basis of a 20-year-old scheme, which has not been updated since then. The agreements of 1993 and 1998 are based on this data. Every year, an agreement on water quantity is achieved; on this basis concrete contracts between the national ministries (bilateral or binational) are signed (Petrov, pers. comm., 2007). Currently new agreements are under preparation for the two tributaries to the Aral Sea. The Syrdarya Agreement should have been submitted for government approval by the end of 2007, whereas the Amudarya Agreement could be ready in 2008. The negotiation process is facilitated and financed by the Asian Development Bank (ADB) (Siradjitdinov, pers. comm., 2007).

The governments and BWOs asked the ADB to initiate for the Amudarya Basin a process similar to the one started for the Syrdarya. The first meeting for the Amudarya was held in Ashgabat in April 2006 (Abdukayumov, pers. comm., 2006).

Within the transboundary work area, ADB could rely on preparatory work that had been carried out by the Organization for Security and Cooperation in Europe (OSCE), the UN Economic Commission for Europe (UN-ECE) and the UN Economic and Social Commission for Asia and the Pacific (UN-ESCAP). The World Bank, which issued a report on the water and energy nexus in the Syrdarya Basin, provided additional expertise.

The establishment of the Chu-Tallas River Basin Organisation proved to be quite a success; the Basin Organisation was founded on July 26, 2006, in Bishkek, the Kyrgyz Republic²⁶. The dialogue on water policies, however, resulted to be much more challenging. The project start was delayed for over a year because Uzbekistan was very reluctant to join the process at the beginning. But it was also clear from the beginning that Uzbekistan is too important a player in the basin's water management, and that a process without Uzbekistan's participation would not be successful. Therefore, patient efforts were made in order to convince Uzbekistan to join the process, and finally the first meetings took place in 2005.

The meetings are organised by a working group of each country: representatives from the fields of water management, energy, nature conservation, economics, foreign affairs and justice. However, the composition of each country's delegation sometimes differs, and all sectors are not always represented. ADB acts in the meetings as facilitator; it provides meeting venues, technical equipment, and facilitation of the meetings. ADB-sponsored meetings are often connected to the assemblies of ICWC, and are scheduled two days before the ICWC meeting. In these two days, specific policy issues are discussed, and in case the working groups are not able to come to a conclusion, due for instance to the political sensitiveness of the issue, these are presented to the ICWC's assembly for clarification. In practice, drafts of the agreement are prepared with assistance of ICWC. ADB helps improve the overall layout of the document, revise the wording of the paragraphs and put its content in an appropriate order. Overall, the negotiation process has been quite long and time-

²⁶ The homepage for this process can be found at <http://talaschu.org/index.php>.



consuming, which is particularly true for sensitive issues such as the water and energy nexus. But even if the process is slow, certain successes have been achieved. It is very important that each party realises that their concerns are visible and a subject for discussion for everybody involved.

So far, the emphasis of ADB involvement was placed on the Syrdarya Basin. However, the experiences made in this basin will also help smoothen the process that has now been started for the Amudarya. An important issue in the Amudarya process is the involvement of Afghanistan. First contacts have been made by ADB and it is targeted to involve representatives of Afghanistan.

The policy process facilitated by ADB also aims to attract the attention of other donor organisations. If a clear transboundary framework exists, commitments to transboundary water management would also become more attractive to other donors. Therefore, the policy processes at the Syrdarya and the Amudarya River Basins are also a good starting point for improved donor coordination and co-operation (Abdukayumov, pers. comm., 2006).

The first negotiations for a new agreement on transboundary co-operation in water management in the Amudarya Basin started in 1997. Until now it has been a difficult process, hampered by different perspectives of the governments and a confrontative approach to negotiations. The process, however, is slowly advancing. The main problems consist of changing governments, which has as consequence a constantly changing composition of the working groups, and the absence of Afghanistan in the negotiations. The Amudarya river is a special case in Central Asia. The river has a low level of infrastructure and the river bed meanders strongly in the floodplains of the lowlands, which comes in combination with complex interrelations with groundwater (Dukhovny, pers. comm., 2007).

On the practical level, a regional working group has been established under the auspices of ICWC. Each Central Asian country appointed two experts; the list of experts was approved by the governments. The domestic experts come from different sectors that include water agencies, ecological agencies, hydropower agencies, and they also include experts of IFAS, ICWC-SIC and ICWC (Kholmatov, pers. comm., 2007).

The negotiations of the agreements take place at the meetings of the ICWC. In the first phase, a list of issues was submitted and a programme of work established. ICWC-SIC is in charge of the technical work. Each republic has its own working group in this commission that consist of different experts. Each government appoints the experts. According to the different preferences, the composition of these working groups differs from country to country. The representatives of the republics meet once a month (Siradjitdinov, pers. comm., 2007).

The new agreement should address reasons for irrational water use (Kholmatov, pers. comm., 2007). Besides water allocation with inclusion of water use for hydropower generation, water quality will make a special chapter in the agreement. (Siradjitdinov, pers. comm., 2007).

Regarding information management and exchange, a long discussion has taken place for a separate agreement. However, the process is stuck and it does not seem very likely that it will become reality in the near future.

The establishment of a new commission for the Amudarya is also endangered by similar obstacles. The disagreements between the parties appear to be of a fundamental nature, with little flexibility between the poles of hydropower generation on the one hand and irrigated agriculture on the other. There are some suggestions that such a commission should be put under the auspices of the United Nations system. This could give the needed neutrality for negotiations (Kholmatov, pers. comm., 2007; Abdullaev, pers. comm., 2007). However, the chances for a new basin commission that would address the specific challenges of the



Amudarya, which differ from those of the Syrdarya, appear to be rather small. The Amudarya's BVO is still in place, but it is mainly responsible for water distribution (Wilson, pers. comm., 2007).

4.2.3 Supra-regional Co-operation and Discourses

Supra-regional co-operation and discourses rarely derive from single donor-driven initiatives, and they seldom aim at the resolution of concrete problems. However, they offer the opportunity to reflect on pressing issues from a more global perspective, and to provide more general guidelines with the help of which governments, interstate organisations and donor organisations may orientate their policies and future plans.

In the context of transboundary water management and donor involvement, two main streamlines were repeatedly mentioned in the interviews: the Central Asian Water-Energy-Nexus and the Asian Pacific Water.

4.2.3.1 Central Asian Water-Energy-Nexus

The interlinkages between the water and energy sectors become most obvious in the water-for-energy trading arrangements set-up between the upstream and downstream countries in the basin. These arrangements entail their own set of negotiations. Coupling water and energy issues is considered instrumental to preventing conflicts over water use. Still, the actors network are currently emerging and need to be consolidated in future.

In Central Asia water management is inherently linked with the energy issue. While the upstream countries face a significant lack of fossil fuel resources and are increasingly dependent on hydropower generation, particularly in winter, the downstream countries urgently need an abundant but regulated water flow during the summer season for irrigation purposes. A prominent example for such an interlinkage is the Kyrgyz Toktokul water reserve. The agreements regarding the water flow regulations of the water reserve date back to Soviet times. In the past Kyrgyzstan received fossil fuel in winter time, in exchange for hydroenergy provided to the border regions of Kazakhstan and Uzbekistan in the summer season. After independence in 1991, Kazakhstan and Uzbekistan maintained the agreements of the past. The agreements made in 1992 and 1998, however, never really worked out. The possibility of energy shortfalls led Kyrgyzstan to release more water in winter. As a result, water for irrigation is very restricted in summer. An additional negative side-effect is the environmental damage due to the winter releases, which caused waterlogging (Wilson, pers. comm., 2007).

Even if the situation in the Amudarya is not as exacerbated as in the Syrdarya, the projections for the Amudarya upstream countries Tajikistan and Afghanistan point towards increasing tensions with the downstream riparians. Both Tajikistan and Afghanistan are interested in increasing the use of water reservoirs for hydropower generation. In addition, Afghanistan has plans to significantly enlarge the area of irrigated agriculture. This would place an additional pressure on the water resources in the Amudarya Basin (Petrov, pers. comm., 2007).

Recently, there have been initiatives of the upstream countries of the Aral Sea Basin to join forces in the water and energy sector. On June 6, 2006, the Iranian Minister of Energy, Parviz Fattah, and the Afghan Minister of Energy and Water, Mohammad Esmail Khan, signed a memorandum of understanding (MoU) on cooperation in the water and energy sectors²⁷. The Tajik government joined this MoU one month later, in a meeting in Dushanbe (Mukhamadiev, pers. comm. 2007). Another initiative was launched on occasion of a visit of the Kyrgyz Foreign Minister, Ednan Karabaev, to Dushanbe. Tajikistan and Kyrgyzstan

²⁷ Islamic Republic News Agency (2006): internet news of 26. June 2006, <http://www.irma.com/en/news/view/line-22/0606269055122325.htm>.



agreed to set up a joint Water and Energy Consortium on their own, which will resolve regional water and energy disputes.²⁸ Other sources comment that such a consortium only could succeed if the downstream countries are also brought to the table. The Tajik-Kyrgyz initiative appears to still be powerless, with no secured funding so far.²⁹

For a long time the so-called Water-Energy-Nexus has been on the agenda of major donor organisations such as the World Bank, EBRD, ADB and also UNDP stated the nexus in the 2005 Human Development Report for Central Asia³⁰. The idea about it is not to focus at the basin scale but on the energy potential of water (Khoshmukhamedov, pers. comm., 2007).

4.2.3.2 Asian-Pacific Water Forum

A first Asian Pacific Water Forum was held in Beppu, Japan, on December 3-4, 2007. The initiative for this forum goes back to the 3rd World Water Forum in Japan in 2003; at the 4th World Water Forum plans for the realisation became more concrete. The APWF was officially launched on September 27, 2006 at the headquarters of the Asian Development Bank, in the presence of former Prime Minister of Japan Yoshihiro Mori, who succeeded Mr. Hashimoto as the President of Japan Water Forum.³¹ The initiative, also supported by the regional branches of the Global Water Partnership in the Asian Pacific, assembles the water ministers of the Asian Pacific, donor organisations, scientific institutions, NGOs and other organisations of water users. It provides a network of exchange in order to address the challenges in water management in the region.

A working group with the participation of Afghanistan and three Caucasus countries has been established in preparation of the APWF. Representatives of the working group have met with Oda Hideaki, the Secretary-General of the 3rd World Water Forum, in Almaty in March 2007; only Afghanistan did not attend the meeting. At the meeting each country party presented their vision on the priority themes selected for the APWF (see below). These ideas were further developed in a second preparatory meeting in September 2007, in Ashgabat. The Executive Committee of IFAS acted as co-organiser of the forum, and the International Commission on Sustainable Development under IFAS also supported the process (Kholmatov, pers. comm., 2007).

Priority themes to be discussed at the APWF from the Central Asian perspective were:

1. Water Financing
2. Water-related Disaster Management
3. Water for Development and Ecosystems

The forum could be a useful instrument for attracting the interest of donor organisations, as well as of the international community. It could become a network useful for promoting IWRM in Central Asia (Wilson, pers. comm., 2007). The practical implications of such a forum appear however to be vague; its real benefits might be limited (Abdukayumov, pers. comm., 2007).

²⁸ The European weekly: news of 2. June 2007, http://www.neurope.eu/view_news.php?id=74509.

²⁹ Institute for war and peace reporting: news of 2. June 2007, http://iwpr.net/?p=bca&s=b&o=335773&apc_state=henbbcadate2007.

³⁰ UNDP Regional Bureau for Europe and the Commonwealth of Independent States (2005): CENTRAL ASIA HUMAN DEVELOPMENT REPORT – Bringing down barriers: Regional cooperation for human development and human security, Printed in Bratislava, Slovak Republic.

³¹ <http://www.apwf.org/about/index.html>



4.3 Initiatives for better donor involvement co-ordination in Central Asia

At the national level there are not so many overlaps in donor involvement. At the regional level, however, there is a clear lack of co-ordination.

Large organisations such as ADB are attempting to increase donor co-ordination on transboundary water management in central Asia. One way this is put into practice is through informal experience exchange, made possible due to the fact that most donor organisations with an emphasis on regional co-operation are based in Almaty, Kazakhstan. Opportunities are also provided by events like the inauguration of the River Basin Organisation Chu-Talas, which gather different donor organisations for discussions on current development issues and prospects for synergies by complementing single efforts. Institutionalised instruments for donor co-operation, however, have not been established so far on the regional level (Abdukayumov, pers. comm., 2006).

At the Uzbek national level, donor organisations meet on a quarterly basis. These meetings aim at joint discussions on single issues of water management in Uzbekistan. The objective is less to identify options on co-operation, but rather to provide a forum for experience exchange on certain issues. The last two meetings in 2005 and 2006, for example, were dedicated to the newly created Water Users Associations (Abdukayumov and Nasritdinov, pers. comm., 2007).



5 Uncertainties in the Amudarya Basin

For the analysis of the transboundary management regime in the Amudarya Basin we refer to the conceptual approach of the NeWater project, which underlines that the complexity of water management systems determines an increasing uncertainty. This implies the requirement that sustainable water management take this uncertainty into account in order to be more adaptive. In this context, the task is also to create awareness of uncertainty and to specify which elements of the system hold the greatest sources for uncertainties.

The management of natural resources is exposed to a variety of uncertainties. According to Brugnach et al. (2007), uncertainty “*refers to the situation in which a decision maker does not have a unique and complete understanding of the system to be managed*”. It is possible to form the simple equation: the higher uncertainty is, the less is the understanding of the system and the less adapted the management decisions will be. In consequence, a first step in the analysis that identifies opportunities for change towards more adaptive management solutions is the identification of uncertainties that are intrinsic to a system.

Brugnach et al. (2007) have identified three types of uncertain knowledge in regard to a natural-technical-social system:

- Unpredictability,
- Incomplete knowledge, and
- Multiple knowledge frames (ambiguity).

Unpredictability refers to uncertain behaviour of a system due to its complexity, which appears unlikely to be overcome in the near future. This uncertainty often has to be accepted as a matter of fact. Incomplete knowledge, on the contrary, is caused by an incompleteness of data or by ignorance. This deficiency can be resolved if there are sufficient resources and time. A particular case of uncertainty – the multiple knowledge frames or ambiguity – arises from different perspectives on one situation. In this case the parties involved find difficulties to align their different interpretation of reality.

Water management is embedded in the complex of natural, technical and societal systems. Even if these systems are strongly interlinked with each other, it is worthwhile to consider them separately in the context of an analysis of uncertainty.

The Amudarya Basin is characterised by many factors that are to date still very unpredictable. Even if estimations of climate change effects predict only minor changes for the availability of water resources in the next decades, there is uncertainty about the reaction of the basin’s vulnerable ecosystems to even the slightest changes. In addition, a minimal decline in crop production could have severe adverse effects for the rural population and could cause poverty at a large scale. The existing large-scale irrigation infrastructure and water reservoirs such as the Lake Sarez in the Pamir are also subject to uncertain developments. Nobody really knows for instance how the water reservoir will react in the event of earthquakes. From the societal point of view the region still faces a very unstable geopolitical situation, with the unpredictable developments in Afghanistan and Central Asian governments in danger of becoming totalitarian regimes. In all these examples, there is little opportunity for water management to have significant influence or control of the underlying reason. However, decision makers, particularly at the transboundary scale, have to be aware of these factors.

Incomplete knowledge in the Amudarya Basin is directly related to the existing information management system. The current system of information management and exchange results in data limitations.



In the first place, the insufficient technical equipment leads to an incomplete picture of the condition of water resources. In addition, currently there is no unified data collection system used by all riparian states. As a result available data is often incongruent and difficult to apply at the basin scale. While there is a lack of knowledge regarding water availability and water quality, there is also no sufficient inventory of the technical infrastructure in regard to accurate assessments of actual water losses due to the system. It is also difficult to quantify the consequences that changes in water availability and quality may have for national economies in the future.

From the technical point of view, thus the availability of hard data and facts, there are attempts to improve the availability and flow of information. The existing network of Hydromets in the five Central Asian states sets a good basis for further improvements. The Hydromets conduct mutual training workshops that aim at education and knowledge update for the Hydromet scientists. These efforts are partly own initiatives and partly supported by donor organisations. In the context of the upgrade of the data collection system existing biases have to be considered. The attempt to establish a regional Hydromet with the objective to establish a unified database for the (Aral Sea) basin failed due to reluctance of the national Hydromets. As a lesson learned that can be drawn from this experience other instruments should be developed for a better and basin-wide access to relevant information.

In regard to a better understanding of the water management system and a better cooperation among sectors, an emphasis has been put on the assessment and further development of national strategies. Kazakhstan is a forerunner in this respect. Even if not belonging to the Amudarya Basin the Kazakh experiences may set guidelines to water strategy development currently in process in Tajikistan, Turkmenistan and Uzbekistan. Coherent national water strategies of the riparian states would also further contribute to interstate arrangements as they provide for clearer positions and more transparency also in transboundary negotiations.

It is however not only the limitation of the availability of hard facts that causes uncertainty in the Amudarya Basin; other components also contribute to an increased uncertainty in its water management. Information management also implies being aware of the specific viewpoint of relevant actors, as well as sharing existing knowledge. This is what Brugnach et al. (2007) identify as multiple knowledge frames. The current top-down approach in the Amudarya Basin significantly hampers this information flow. High-level government bodies have little connections to the lower level. The same is true for the exchange of knowledge among different sectors. As a result, information on reciprocal influences and effects of other sectors on water management are fragmented and incomplete.

In the light of these considerations the adaptive capacity of the information management system in the Amudarya Basin appears to be weak. Under these conditions the current approach to water management will have difficulties to identify occurring changes and/or risks. There are, however, some encouraging initiatives that appear to go the first steps in the direction of more adaptive management styles.

Developments that point in this direction - decreasing uncertainty and/or increasing preparedness in the face of uncertainties - are:

- First attempts to improve information management; a good starting point,
- National water management strategies as a basis for better informed negotiations at interstate level,
- A new basin agreement which will provide for a better legal framework (inclusion of Afghanistan),
- Supra-regional discourses providing policy back-up for basins.



These examples also make clear that these initiatives cannot stand alone, but always need be embedded in a multilevel governance structure.



6 Lessons learned from the Amudarya – contributions to a framework of analysis

For the analysis of the transboundary water management regime of the Amudarya Basin, an approach developed by Raadgever et al. (2008, forthcoming) will be applied. It aims to derive five central regime elements of transboundary water management systems and applies these as a basis for delineating the respective regime type and its capacity for adaptation.

The approach applied by Raadgever et al. started out by identifying main features of transboundary water management regimes and their development. Based on a literature-review of the most relevant regime elements, it continued to derive hypotheses regarding the ideal configuration of each of these regime elements in an adaptive water management regime. The approach also defined detailed indicators which assist in assessing a water regime's adaptive capacity.

Of the five central regime elements - actor networks, water law, water policy, information management and finances - *actor networks* are considered to be of central importance, as they provide for the laws, policies, etc. that structure all activities and relations within a water management regime.

The continuous, active and mutual learning of all actors is highlighted as a central attribute of adaptive water management. While this learning process is highly dependent on processes that allow for a constant exchange of information and knowledge, it also calls for the active co-operation between different sectors and levels in river basin administration (Huitema et al., 2007). This requirement also clearly highlights the benefits of considering the governance structure in transboundary river basins as a multilevel governance set-up. It is multilevel governance not only due to the interaction of various administrative levels in a governance regime and their respective interaction, but the label also refers to the different groups of actors as components of a multilevel structure (Olsson et al., 2006).

Transboundary river basins constitute a particularly complex example of multilevel governance. Not only is their management determined by a multitude of administrative levels – the international, national, regional and local levels – but also several sets of these, according to the number of riparian countries in a transboundary river basin. In addition, the number of actor groups is also correspondingly larger. In addition to the numerous state authorities from the different riparians, it is often so that other stakeholder groups play a role in transboundary water management, including non-governmental organisations, donors or academia. Co-ordination, learning and exchange among these actors become a paramount issue. Legal frameworks, policies and - as the most crucial boundary condition - the provision and exchange of information are important factors in structuring these actor networks.

As a consequence, the *legal framework* catering to such complex actor structures at various administrative levels needs to display a similar degree of flexibility. In practice, international law relating to water management is rather fragmented and subordinate to national water laws, thus rendering it difficult to accommodate all possibly desirable provisions concerning integrated water resources management, governance networks, public participation, information management, planning and implementation, as well as financial aspects. Thus, transboundary water law should not only be evaluated on account of how much clarity and attention to detail it provides, but also the on the basis of the degree to which it integrates and takes into account the possibly very different national water legislation that underlies the international legal framework.

Especially, when it comes to implementation, this is where the necessary steps need to be taken most of the time.



To some extent, the formulation at the international level of *adequate policies*, i.e. the development of formal documents prescribing (future) water management approaches, can favour the implementation process at all levels. In this context Raadgever et al. suggest that policies should consider the full range of possible measures and outcomes and allow for adaptations of the strategies if needed. The authors also suggest for policy options to be tested in small-scale policy experiments or model simulations, if necessary. In reflecting the legal framework, these policies can significantly assist in the implementation process in an adaptive manner at all levels by creating an environment open for co-operation and learning. While legal frameworks are considerably more inflexible, policies allow for more flexible solutions and quicker adaptations to changing boundary conditions.

With regards to *information management* - clearly a central requirement to integrated water resources management at any given level in a river basin - again the challenges are compounded at the international level, as it requires co-ordinating and concerting various information sources, as well as needs, at various levels in the different countries. In order to provide for an adaptive management approach in this respect, Timmerman and Langaas (2005) argue that information should be produced and shared among the variety of different stakeholders, while inherent assumptions and limitations are to be clearly communicated, in order to establish transparency and minimise the risk of misinterpretation (Gooch, 2004). Furthermore, according to Pahl-Wostl (2005) new information must be available to the system in order to be prepared for uncertainties due to future environmental change; the system must be able to process this information and change in response to it.

Finally, some of the indicators established in the evaluation framework also address financial aspects in transboundary river basin management. On a normative basis, the availability of sufficient financial resources is set as the ultimate goal. Again, agreement and negotiation among all river basin actors should lead to joint and widely supported decisions regarding investment. Cost recovery for water services is increasingly being considered and used as a tool for providing sufficient long-term funding for river basin management. A necessary precondition is a clear agreement between the different user groups as to the value of the natural resources in the basin, as well as transparency regarding the use of funds raised through water use charges. Last but not least, while a fair share of the burden for water uses should be the ultimate target, adaptive water resource management should provide support for disadvantaged user groups if necessary.

While this framework provides a guideline for the assessment of the adaptiveness of a transboundary water management regime, in the form of a normatively set 'ideal' water management regime, the second question central to NeWater relates to the regime's transition process. The focus is on the conditions for this process, in which current water management systems would develop to approach the 'ideal' state.

Research on societal transition processes as well as driving forces is currently emerging as an interdisciplinary field of science. The conceptual approach developed in the context of Newater recurs to the definition of Rotmans et al (2001), which describes transitions as '*continuous processes of societal change, whereby the structure of society (or a subsystem of society) fundamentally changes*'.

Focusing on transitions in transboundary water resource management, a multi-level approach appears to be helpful in discerning inter-relationships between processes at three levels – the macro-, meso-, and micro-levels (Kemp et al., 2005).

The macro-level provides the context for water management and encompasses environmental variability, legal frameworks, deeply rooted societal norms and cultural values. In a transboundary river basin this would also include international agreements and policies regarding shared water management. These are intrinsically linked with the meso- or management level, both at the international and national level, where these policies are



implemented and translated into concrete management decisions. Relations and decision-making structures at this level are usually not very receptive to change, because long-established approaches tend to be difficult to overcome as a result of their often being ingrained in institutions. On the contrary, it's at the micro-level where innovative approaches can develop and flourish. This is where the potential for transition is considered highest. The main challenge therefore is to overcome rigid management structures at the meso-level and translate positive impulses from the micro-level, so as to produce results at the macro-level, while taking into account the possibility that impulses for change might also derive from the macro-level. In transboundary river basins, for example, dynamics due to global change and socio-economic developments are in many cases compounded by interactions between the individual riparian states in a river basin.

Raadgever et al. create in their paper an ideal type of a transboundary water management regime that represents the maximum adaptiveness in regard to existing and unavoidable uncertainties. The reality of water management practices, however, comprises many factors that constitute additional uncertainties intrinsic to the system. Since information management represents the hub of effective water management (refer to chapter 3.2) it provides for a good starting point for the analysis of transboundary water management in the Amudarya Basin.

The current review and recent arbitration of an interstate agreement for the Amurdarya Basin point in this direction. Raadgever et al. identified a complete and clear legislative framework for transboundary co-operation as one of the core prerequisites for adaptive management. At the moment the process appears to be difficult and important issues such as an agreement on information management are unlikely to be resolved in the near future. The ongoing process however is a first step. The inclusion of Afghanistan in the negotiation process and the discussion of issues neglected so far provide opportunities to generate new impulses towards more adaptiveness.

On the supra-regional level, and going beyond the basin scale, drivers exist that could influence the way water management is addressed. Platforms such as the Asian Pacific Water Forum may not have concrete influence on the practical side of water management; however, they may contribute to discussions from a more global perspective.

In the light of these considerations the following recommendations can be derived for the Amudarya river basin.

Availability of data

- The data collection and monitoring system could be improved. In this context it will be more important to find solutions that are operational in the daily life conditions. The data should be comparable throughout the whole basin. There is little use to have equipment that needs a lot of maintenance and to which spare-parts are difficult to procure. Scientific coordination between the national hydromets should be strengthened and more efforts should be placed on data validation.
- Information should be available to all interested parties without bureaucratic obstacles and at low costs. While it appears to be very important that the national hydromets currently operate at the national level, where they also want to keep their data basis, the mechanisms for the exchange of data of transboundary relevance should be improved. At the same time the Hydromets have to have access to sufficient funds to guarantee their operation.
- It could be useful to detach the financial resources of the Hydromets from service charges for hydrometeorological data.



- The information needs of decision makers and practitioners as well as other relevant stakeholders from other sectors should be better assessed.
- The elaboration of national IWRM strategies should include a thorough assessment of the information needs of decision makers and practitioners

Information exchange

- In regard to information exchange, awareness should be raised that information on river basin management is not a state secret but information that other parties need to have for a good management.
- Clear and transparent mechanisms for information exchange among the riparian states that reflect the existing institutional set-up have to be established. In this regard, information should be available at low cost.
- In addition, it would be beneficial to improve coordination among scientific institutions and to abolish obstacles for a vertical information flow. This could be achieved through improvements of the cooperation among government bodies at different scales and through introducing regular information events and public consultations.

Involvement of donor organisations

- The involvement of donors, which can contribute significantly to the financial backing of the improvements required in water management, also play a major role on the way towards more adaptiveness. However, on the transboundary level a focal point that could provide for better coordination is not yet in place.
- Donor coordination should be improved. Coordination should be a mixture of governmental initiatives and a meeting platform of donor organisations.
- While it is important that the ownership of donor supported projects is with the Central Asian governments, donor organisations still want to keep control of their involvements. It would be useful to include this issue in the negotiation of the Amudarya agreement.

To summarise: The case of the Amudarya Basin demonstrates that the transition from a hardline top-down water management approach, as set up under the Soviet Union, to an integrated water resource management that opens up possibilities for new and more adaptive solutions is a long and difficult process. The basin also gives evidence to the fact that solutions that have been successful in other parts in the world cannot be applied on a one-to-one basis in other regions.

Regarding a further development of a framework of analysis, the concepts of Raadgever et al. provide a good starting point because they help cluster the main elements of a transboundary management regime and also help identify the system's driving forces. There is, however, the risk of oversimplifying the system, and that the analysis is carried out using assumptions that are not close enough to reality, because one loses sight of the aspect of multilevel interaction of the regime.



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