

Towards adaptive water governance observations from two transboundary river basins

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Abbreviations

ASBP	Aral Sea Basin Programme
BVO	Basseynoé Vodnoé Obedinenie (Basin Water Organisation)
EC-IFAS	Executive Committee of International Fund for saving the Aral Sea
ICAS	Interstate Council on the Aral Sea basin
ICWC	Interstate Commission for Water Coordination
ICWC-SIC	Interstate Commission for Water Coordination Scientific Information Centre
IFAS	International Fund for saving the Aral Sea
ORASECOM	Orange-Senqu River Commission
RBO	River Basin Organisation
SADC	Southern African Development Community

1. Introduction

Water governance in transboundary basins often comprises complex structures involving various types of actors at multiple governance levels. It has been argued that this complexity substantially impacts the basins' capacity for reacting in a flexible way to changing boundary condition, such as for example environmental degradation and water scarcity due to climate change.

Major problems are rooted in the incongruity of ecosystem and political-administrative spatial units and the resulting necessity to co-ordinate and align different approaches to water management of the different riparian countries. In addition, nationally and locally prevailing water management paradigms and different notions of the value of water in different cultural communities reinforce existing path dependencies rendering adaptive measures rather difficult at the transboundary level.

This paper takes a closer look at the situation in this respect in two transboundary river basins in Central Asia and Southern Africa – the Amudarya and the Orange – and in employing a frame of reference established in the context of the Newater project, first attempts to assess the regime type with view to its adaptive capacity from an institutions-centred point of view. In a second step, the potential for a transition to more adaptive forms of water management within the given institutional structure will be subject to a brief evaluation. While recognising the fundamental difference of the two basins, still common regime elements can be identified as they universally hinder or promote the transition to adaptive water management. In deriving common elements particular emphasis is place on the influence of uncertainty in river basin management decisions.

2. Conceptual Approach: Adaptive Water Management in Transboundary Basins

In addressing adaptive water governance in transboundary river basins several strands of literature need to be taken into consideration, of which three should be mentioned as a frame of reference for this contribution: literature on the management of transboundary environmental goods, such as shared river basins, literature on multilevel governance of environmental goods as well as increasingly emerging contributions on the adaptive management of water resources.

While it is not the primary aim of this paper to subject these different approaches to a comprehensive assessment or review, reference will be largely made to an approach developed by Raadgever et al. (2007, forthcoming), which aims to derive five central regime elements of transboundary water management systems as a basis for delineating the respective regime type and its respective capacity for adaptation. We will largely follow this approach for the two case study basins and complement the insights by an assessment of the factors favouring or blocking transition.

The framework established by Raadgever et al. starts out with identifying main features of transboundary water management regimes and their development. Based on a literature-driven collection of the most relevant regime elements, the approach then continues to derive hypothesis as to the ideal configuration of each of these regime element in the case of an adaptive water management regime. The framework establishes detailed indicators, which assist in assessing a water regime's adaptive capacity. The following section can only but re-iterate some of the factors of relevance for the assessment of the cases under consideration in this paper.

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

With regards to adaptive water management, the continuous, active and mutual learning of all actors is highlighted as a central attribute. While this process is highly dependent on processes allowing 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, Egas et al. 2007). This notion also clearly highlights the benefit of considering the governance structure in transboundary river basin as a multilevel governance set-up. Multilevel governance not only considered the interaction of various administrative levels in a governance regime and their respective interaction, but it 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 do they comprise a multitude of administrative level – the international, national, regional and local levels – but several sets of these, according to the number of riparian countries in a transboundary river basin. In addition, the number of actor groups is automatically compounded as well. In addition to numerous state authorities from the different riparian, oftentimes other stakeholder groups play a role in transboundary water management, including non-governmental organisations, donors or academia. Co-ordination, learning and exchange among these becomes paramount. Legal frameworks, policies and as 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 actors structures at various administrative needs to display a similar degree of flexibility. In reality, 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 it is not only the clarity and sufficient attention to detail transboundary water law should reveal, but also the degree to how it integrates and take account of the possibly very different national water law underlying the international framework law.

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 of *adequate policies*, i.e. the development of formal documents prescribing (future) water management approaches, at the international level 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 the co-ordination and concertation of various information sources as well as needs at the various levels in the different riparian 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 and the system must be able to process, and change based on this new information.

Indicators established in the framework finally also relate to *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 the actors in a river basin should lead to joint and widely supported decisions on investment. Cost recovery for water services used is increasingly considered and introduced as a tool for providing for sufficient funding for river basin management in the long run. As a necessary condition there needs to be a clear agreement as to the value of the natural resources in the basin to the different user groups as well as transparency as to the use of funds raised for water use charges. Last but not least, while a fair share of the burden for water uses should be the target, adaptive water resource management will also provide support for disadvantaged user groups if necessary.

While the previously presented framework provides for a guideline for the assessment of the adaptiveness of a transboundary water management regime in form of a normatively set 'ideal' water management regime, the second question central to Newater relates to the transition process, current water management systems need to undergo, in order 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, Rotmans et al. 2005).

The macro-level provides for 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 entail the international agreements and policies on shared water management, while intrinsically linked with the meso- or management level at the international as well as 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. Long-established approaches are difficult to overcome and change as they are often engrained 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. With regards to transboundary river basin management the main challenge therefore exist

to overcome rigid management structures at the Meso-level and translate positive impulses from the Micro-level to take effect at the macro-level, while taking into account that impulses for change might derive from the Macro-level as well. 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 riparians in a river basin.

Such transitions are usually characterized by a relatively high degree of uncertainty. According to Walker et al. (2003) one can generally differentiate two different types of uncertainties in the context of water management. Firstly, uncertainty (*ontological uncertainty*) originating from the inherent variability of the system and secondly uncertainty (*epistemic uncertainty*) due to imperfect knowledge of the system. Uncertainties arise at different stages and different scales in the water management cycle:

- At the starting point of a management cycle, while identifying water management and development issues;
- Within the progress towards IWRM frameworks. The uncertainties related to this process occur in the evaluation of the progress regarding the extent to which an IWRM is implemented.

While this is only a very rough rendition of the role and effect of water management, it will serve as a reference for a first assessment of the water management regime and the role of uncertainties therein in our two case study basins.

3. Case study analysis

The two river basins under consideration for this brief assessment represent fundamentally different river basin management systems. Still, the benefit in comparing or at least contrasting the Amudarya and the Orange is partly derived from the obvious differences in terms of history, political situation as well as the cultural background one encounters in the two regions. In acknowledging these differences the focus of analysis is directed toward the commonalities, i.e. very similar challenges in terms of increasing uncertainty in water management due to changing climate conditions as well as demographic change. This uncertainty already aggravates existing shortcomings in terms of the fair distribution of water resources to the different user groups and the management of river basins at a transboundary scale.

In order to account for the differences in boundary conditions, our analysis aims to control for this by taking a rather strict institutions-based

approach. As institutions reflect actor networks in water management, looking at the current institutional framework as well as the developments that lead up to it, will allow for an assessment of the possible future trajectories of the water governance regime in the respective basins in the years to come and whether these align with the normative adaptive management paradigm or not.

Following an introduction to the institutional set-up in each river basin and its main actors, we continue with a mapping of the regime type detailing the different regime element paying particular attention to main sources of uncertainties, i.e. threats or challenges to water resource management in the particular basin. In a third step a preliminary assessment of the system's potential for a transition to adaptiveness is undertaken.

The assessment in both cases is based on a series of interviews conducted in Uzbekistan, Tajikistan and Turkmenistan in 2006 and 2007, as well as research in South Africa, Lesotho and Botswana, which is currently on-going.

3.1 Amudarya – general background and institutional set-up

The Amudarya situated in Central Asia was¹ the largest tributary in terms of run-off to the Aral Sea. Water management in the Amudarya is significantly predetermined by the past centrally planned economy under the Soviet Union focussing on the development of large-scale irrigation infrastructure mainly of cotton monoculture. While irrigation agriculture is still the predominant water use in the downstream countries, upstream countries today wish to exploit the hydroenergy potential of the Amudarya. As a result there is a growing competition in water uses that complicates the on-going negotiation process for a new Amudarya agreement.

The current institutional set-up at the transboundary level is predetermined by the 1992 '*Agreement on co-operation in the management, utilisation and protection of interstate water resources*' with Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan as signatories (Vinogradov; Langford, 2001). An institutional re-organisation initiated in 1997² and was legally completed in 1999³.

¹ Today the Amudarya is not reaching the Aral Sea anymore.

² The decision of Heads of the Central Asia states on reorganization of structure of the International Fund for saving the Aral Sea, signed in Almaty on February, 28, 1997

³ The Agreement about the status of IFAS and its organizations signed in Ashgabat on April, 9, 1999.

The *International Fund for saving the Aral Sea (IFAS)* is the overarching institution in transboundary water management. IFAS consists of several administrative bodies including the Interstate Commission for Water Coordination (ICWC), the ICWC Scientific Information Centre and the BVO Amudarya, the basin management organisation for the river.

IFAS is an organisation that implements the decisions of five Central Asian Presidents. The superior task of IFAS is to tackle the ecologic issue in the Aral Sea Basin (Kholmatov, pers. comm., 2007). 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)

ICWC furthermore comprises the BVOs for the Amudarya and the Syr Darya, 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 agreed quotas to users in the basin. It also controls the discharges to the Aral Sea and the operations of interstate reservoirs. (UNECE/UNESCAP 2004).

The Scientific Information Centre (SIC) has been established under the auspices of ICWC. (Dukhovny, pers. comm. 2007). It provides for scientific training as well as scientific research relevant for water management in the Aral Sea Basin.

Important actors in transboundary information management and exchange are the *national hydrometeorological services (Hydromets)*. All riparian states to the Amudarya operate a national Hydromet, which belong to the international network 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 these data (Yakovlev, pers. comm. 2007).

International donor organisations constitute a main 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-TACIS programme.

After the independence of the Central Asian states, international donor assumed a very important role in shaping the international water management process in the region, engaging not only in financing and enabling concrete projects, but also facilitating the consolidation of institutions for transboundary water management and the design of international agreements on shared water resources. The international organisations were in-

strumental in keeping the momentum in the efforts to foster to 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 link in energy issues, thus ensuring that upstream countries would not divert the water courses for their own uses.

After a strong focus on donor activities related to the entire Aral Sea basin in the early 1990, a subsequent lack of success and widespread disenchantment of the donor community, donors have shifted their activities 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 human health care.

Current efforts of donor with regards to transboundary water management in the Amudarya basin concentrate on supporting the up-grade of technical infrastructure (Abdukayumov, pers. comm. 2006).

On the other hand there are increasing initiatives that aim more 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. In the opposite one of the main lessons learnt from the past was that the initiative for new actions should derive from the countries and government themselves.

3.2 Amudarya – Mapping of the regime type and gap analysis

Transboundary water management in the Amudarya Basin is an overwhelming 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 lead 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.

But it is not only the limitation of the availability of hard facts; also other components contribute to an increased uncertainty in water management in the Amudarya Basin. Information management also means to be aware of the specific viewpoint of relevant actors as well as to share existing knowledge. 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 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.

3.3 Amudarya – Assessment of the 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 Amurdarya 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 newly arbitration of an interstate agreement for the Amurdarya Basin guides in the same direction. Raadgever et. al identified a complete and clear legislative framework for transboundary cooperation 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 represents 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.

3.4 Orange – general background and institutional set-up

Water management in the Orange basin is determined by the increasing scarcity of the resource in the region and the struggle of all riparian coun-

tries to secure access and availability to the resource for their future economic development and the welfare of their nations. Availability of water resources is a crucial pre-condition for agriculture and industry in all riparian states of the Orange basin. Among these countries South Africa is assuming a dominant role in comparison with Namibia, Botswana and Lesotho with the effect that water management in the past very often was tailored to meet the demands of the Republic of South Africa.

The river basin of the Orange is the largest watershed in South Africa, and the Orange is the largest river in Africa south of the Zambezi. Approx. 60% of the around one million square kilometres that form the catchment area lie in the country of South Africa. The remainder falls within Botswana (11%), Namibia (25%) and Lesotho (4%), the latter country lying totally within the basin.

The Southern African Development Community (SADC) significantly influences water policy on the Orange basin level. In 1995 the SADC signed the SADC Protocol on Water Resources, which was later modified in view of the UN Convention on the Law of the Non-Navigational Uses of Shared Watercourses, of 1997⁴. Relevant to transboundary river basin management is that it seeks to promote and facilitate the establishment of shared watercourse agreements and shared watercourse institutions, as well as enshrining the principles of reasonable use and environmentally sound development of the resource.

The initiative for creating a Basin commission for the Orange River goes back to 1995. Namibia has been one of the main driving forces within this process, because it became more and more evident for Namibia that bilateral agreements between South Africa and Lesotho would also influence Namibia's water management regime. The agreement that established ORASECOM was finally signed in November, 2000.

With the establishment of ORASECOM existing bilateral agreements remain in force, albeit now embedded into the commission's work and other interested riparian states have now gained means to be better informed about processes under bilateral agreements.

A technical task team and a legal task team support the ORASECOM meetings. These teams that consist of representatives from all riparian states provide for the knowledge base for the meetings. In order to support the continuous work of the Commission a Secretariat of ORASECOM has been established in spring 2007. The secretariat is responsible for the coordination of all activities under the ORASECOM agreement. It is ex-

⁴ The Revised SADC Protocol on Shared Water Resources was signed by the SADC countries in August 2000.

pected that under the umbrella of the secretariat also a unified database will be developed for the Orange Basin. (Mpho, pers. comm., 2006)

Both current donor involvement and donor interest in the basin is high. SADC developed a project portfolio and has implemented a donor coordination mechanism, both widely praised; ORASECOM is following the same principle, and is taking initiatives to assure relevance of donor projects for the commission. Donor involvement has helped address two key areas: capacity-building, on one hand, and information requirements (e.g. baseline studies, analysis of existing information) on the other.

3.5 Orange - Mapping of the regime type and gap analysis

Water resources management in the Orange basin has been determined by a largely technocratic and in many cases also top-down approach, reflecting the past approach to water resources management in South Africa. Before the establishment of ORASECOM, water-sharing arrangement between the riparian countries were mostly focusing on the water needs for industrial uses (energy provision, agricultural production). It was only with the new water law in South Africa that also induced a paradigm shift in the entire basin, while this has not been implemented at the basin scale yet. While the creation of ORASECOM and its subsequent operationalisation provide an important foundation for further changes and improvements, still severe challenges lie ahead, as for example the participation of stakeholder groups as well as questions pertaining to the financing of water resources management at the transboundary scale.

Uncertainties for water management at the transboundary scale clearly arise from marco-level: evidence of climate change in the basin is paramount. However, there is considerable uncertainty as to how these developments should be dealt with. In many instances, technological fixes are suggested in order to meet continues drought periods. These are however not supported by all stakeholders in the basin (Earle, pers. comm. 2006).

Probably the most promising recent development with regards to other sources of uncertainty is the compilation, generation, and exchange of information. A series of initiatives, mainly connected to the bilateral agreements and to donor projects, have provided impulse to the generation of information and its standardisation. A current GTZ project is compiling the information available relevant for an IWRM plan for the basin; subsequent phases would populate the most important gaps identified. A River Basin Study and a GEF sponsored TDA – SAP project are also under development.

The framework within which the co-operation through ORASECOM takes place provides for clear mechanisms of interaction. The Revised Protocol, with its Tribunal that will make binding judgements, is a robust fall-back option in the case that strife would come to prevail in the Commission. The regional integration being aimed for also sets a larger context for co-operation among the riparian countries, increasing the importance of a negotiated solution and enlarging the possibilities for trade-offs and forms of benefit sharing. The structures being generated within the commission also serve a role in “reducing the possible range of outcomes to bureaucratic procedures” and “institutionalising the conflict” (Turton, pers. comm., 2006).

In general, there seems to be significant political backing to transboundary cooperation in the four riparian countries, expressed for instance in the creation of the various RBOs. Government support has however been more reticent in matters related to funding. The commission has basically relied on donors for the funding of its studies, and this poses the question of the sustainability of current efforts in the long term.

Despite rather positive developments in some areas, the commission is struggling with some serious challenges.

Capacity within the commission as well as in the water administration of the individual countries is limited and in some cases seriously threatened with capacity leaving the region, and of an inadequate amount of trained people in the first place.

Secondly, while water sector the reforms in South Africa have put in place a very progressive and advanced framework for water governance, some actors describe this as too ambitious rendering the implementation of the reforms a too lengthy process. As a consequence, the national institutions are caught up in their reform processes and investing most of their efforts in these new structures; the transboundary component of governance is affected negatively by this set of priorities.

Thirdly, while donors constitute a very important actor in transboundary water management in the Orange basin, their role is not uncontroversial. They are accused of only being interested in short-term involvement, with fast results, whereas the regional situation, and the fact that the resources of the local counterparts (e.g. departments of water affairs) are often limited, frequently do not allow for fast project development. Another frequent criticism of donor involvement is that they are hard to move from their own agendas, and often do not show the capacity to listen to local requirements; this would be caused by their own institutional characteristics.

3.6 Orange - Assessment of the potential for transition

Overall, the international discourse on IWRM and adaptive water management is being taken up in the Southern African region, providing for a common framework of reference at the Marco-level.

Focussing on ORASECOM as an institution, which might be in a position to host or trigger a transition towards more adaptive water management the following statements could be derived from the interviews conducted in the basin.

On the more technical level, most local actors see an important possible role for the commission in the area of information management. Up to a certain point this subject is already being addressed by the commission, both due to the efforts of its Interim Secretariat, and due to the current interaction the commission has with donors.

Another area where ORASECOM is almost universally seen as having an important role to play is donor coordination. The institution is seen as an ideal entry point for donor activities; it would ensure adequate added value, relevance, feedback, and quality control of the projects. This role would tie up neatly with its role in information management: being the “hub” of information on water management in the basin would put it into an ideal position to provide information and judgement on the relevance of planned donor activities.

The latest developments in fields such as water management and environmental monitoring, experiences of relevance in other river basins, etc., could be received and propagated by the commission. The transboundary perspective would be integrated in any analysis of the implications of the latest developments; the fact that commissioners are very senior water managers in their respective countries would also guarantee the possibility of diffusion of the results obtained. This, coupled with the expected stakeholder component of the commission, could imply a significant contribution to the social learning processes required in adaptive management.

A further promising opportunity for the institution is the possibility of addressing issues left out of previous bilateral agreements. In the case of the LHWP Treaty, these include emerging ecological issues; the highly detailed and long-negotiated treaty does not provide for the issues currently arising. Due to the commission’s acting on the basin scale, it is also seen as a natural institution for facing large-scale environmental issues in future.

Stakeholder participation is another area in which local actors see possibilities of significant involvement on the side of ORASECOM. Several of the actors interviewed also placed emphasis on the need for establishing benefit-sharing mechanisms, not only between the countries, but also be-

tween stakeholders, e.g. for the agricultural population of Lesotho now being handed the task of avoiding erosion.

Taking a broader look at the prospect for the cooperation among the riparian states in the Orange basin under the impact of climate change, one could argue that due to the “closed” nature of the basin, any change that severely impacts the availability of water resources in the basin could, in theory, cause a retreat of the member states into their spheres of sovereignty. Although the effects of changes in the availability of water resources, such as those derived from climate change, have received much attention from external researchers, local expert opinion concerning the probability of this kind of scenario judges it to be very small. In spite of the system’s “closure”, all its other elements work against a result of this type. On the one hand, the degree of cooperation and trust among the member states is developing strongly. Current cooperation could even result in the building of (more) common infrastructure in the future, according to some predictions. On the other hand, particularly in the case of South Africa, which covers by far the largest area of the basin, their massive water infrastructure is in place, which is managed very conservatively (due to its centrality for the economy of the whole country). This infrastructure does not correspond with current ideas of sustainability and adaptability, but it does provide an impressive buffering capacity and the capacity to adjust to changes in the seasonality of rainfall. As a consequence, long-term changes in the availability of water resources, such as those that could be a consequence of climate change, would probably not hinder the cooperation over water resources in the river basin, whether or not this entails a more adaptive management of water resources in the long run.

4. Interpretation in the light of the conceptual approach

Despite the preliminary character of our findings and the on-going research in both river basins, the following insight could be arrived from our initial analysis of the cases in the light of the conceptual approach developed in the context of the Newater project.

Transitions in transboundary water governance need to be considered from a multi-level governance perspective, i.e. governance structures, including the management of information as well as the interaction with donors are not determined on the international level alone, but display strong linkages to the national and local situation. International institutions as well as international discourses are the determining elements of transboundary water management, but they are also highly contingent on the surrounding institutional framework in the riparian countries as well as influenced by the overarching regional institutional architecture for environmental and specifically water governance. This macro-level framework can have a favouring effect on the transition of transboundary water resources management (in the case of the Orange), but in some instances might prove to be too fragmented and weak in order to effect such changes (in the case of the Amudarya). Often this is related to the fact that institutions for transboundary river basin management as well as other stakeholders display different levels of awareness and preparedness for challenges emerging from global environmental change.

This might also be related to the fact that at the international level, the state is 'still' the main actor in transboundary water governance in both cases, where variations exist as to how much agency beyond the state, e.g. in the form of stakeholder involvement is admitted. While the Orange is slowly opening up for increased participation, this is hardly the case for the Amudarya.

Focusing on individual actors and elements in transboundary water management it becomes evident that in the regional context of our case studies, donors play a major role in co-operation on transboundary water management. While this involvement has the potential to move water management toward more adaptive practices in the long run, in both cases the nature of donor involvement has to some extent proven to be counter-productive, mostly due to its short-termed and agenda driven nature.

Reflecting challenges at the national level, the exchange of information of sufficient quality for decision-making is particularly important as well as challenging at the transboundary level, and a lack there of a major rea-

son for mistrust and consequently mismanagement of resources. This is also the reason, why information deficits are not easy to overcome as information is often treated as a political asset among the riparian countries. With regards to transition management, the exchange of information is crucial and one of the main tasks of the institutional structures emerging at the international level.

Improved management and sharing of information will help in addressing currently prevailing uncertainties in water resources management, which are compounded due to the multi-level structure in transboundary river basins. While this is bound to remain a defining feature of international cooperation on water resources, the issue of trust building among riparian countries cannot be over-emphasized, as this would help in overcoming current information deficits.

The two river basins analyses as case studies in the context of Newater, display different stages in the process towards adaptive water management, as the institutional set-up varies significantly together with certain other factors. The main question however, that will also be addressed during the continued course of the project will further look at the role uncertainty play in decision-making, its impact and respective remedies. In taking a yet closer look at the interlinkages of the different water governance levels and its ramifications for a transition to adaptive water management, a main question will be to determine whether the water management regime is actually set on a trajectory to adaptive water management or whether development vectors point into other directions.

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