

MANAGING ADAPTATION

International Donors' Influence on International River Basin Organizations in Southern Africa

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ABSTRACT

Today, many of the world's river and lake basins are threatened by environmental problems such as change in river flow, water pollution, reduced water availability, salt water intrusion, or loss of plant and animal species. International River Basin Organizations (RBOs) governing such rivers are increasingly in need to address such challenges. At the same time many of them receive technical and financial support from international donor organizations. The paper therefore addresses the question of how international financing institutions support adaptation capacities of RBOs. The aim is to identify conditions under which donor support to RBOs can support adaptation to environmental changes and improve the resilience of international water basins. It does so by focusing on two cases in Southern Africa, including the Orange-Senqu Basin and the Orange-Senqu River Commission (ORASECOM) as well as the Cubango-Okavango Basin and the Permanent Okavango River Basin Water Commission (OKACOM). The findings of the paper illustrate an ambivalent role of international donors with regard to river basin adaptation. While they do provide important means for adaptation in form of knowledge, financial and technical resources, they can, at the same time, threaten the long-term sustainability of adaptation activities.

Key words: Transboundary rivers, river basin organizations, environmental change, adaptation

SERIES FOREWORD

This working paper was written as part of the Earth System Governance Project, a ten-year research initiative launched in October 2008 by the International Human Dimensions Programme on Global Environmental Change under the overall auspices of the Earth System Science Partnership.

Earth system governance is defined in this Project as the system of formal and informal rules, rule-making mechanisms and actor-networks at all levels of human society (from local to global) that are set up to prevent, mitigate and adapt to environmental change and earth system transformation. The science plan of the Project focusses on five analytical problems: the problems of the overall *architecture* of earth system governance, of *agency* of and beyond the state, of the *adaptiveness* of governance mechanisms and processes, of their *accountability* and legitimacy, and of modes of *allocation and access* in earth system governance. In addition, the Project emphasizes four crosscutting research themes that are crucial for the study of each analytical problem: the role of power, of knowledge, of norms, and of scale. Finally, the Earth System Governance Project advances the integrated analysis of case study domains in which researchers combine analysis of the analytical problems and crosscutting themes. The main case study domains are at present the global water system, global food systems, the global climate system, and the global economic system.

The Earth System Governance Project is designed as the nodal point within the global change research programmes to guide, organize and evaluate research on these questions. The Project is implemented through a Global Alliance of Earth System Governance Research Centres, a network of lead faculty members and research fellows, a global conference series, and various research projects undertaken at multiple levels (see www.earthsystemgovernance.org).

Earth System Governance Working Papers are peer-reviewed online publications that broadly address questions raised by the Project's Science and Implementation Plan. The series is open to all colleagues who seek to contribute to this research agenda, and submissions are welcome at any time at workingpapers@earthsystemgovernance.org. While most members of our network publish their research in the English language, we accept also submissions in other major languages. The Earth System Governance Project does not assume the copyright for working papers, and we expect that most working papers will eventually find their way into scientific journals or become chapters in edited volumes compiled by the Project and its members.

Comments on this working paper, as well as on the other activities of the Earth System Governance Project, are highly welcome. We believe that understanding earth system governance is only feasible through joint effort of colleagues from various backgrounds and from all regions of the world. We look forward to your response.

Frank Biermann

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1. INTRODUCTION

In many internationally shared water basins riparian states have established international River Basin Organizations (RBOs) to jointly address coordination problems as well as to exploit cooperation potentials that emerge from the transboundary nature of shared water bodies (SADOFF AND GREY, 2005; SCHMEIER, GERLAK, AND BLUMSTEIN, 2015). Many international river basins are however progressively threatened by environmental changes such as alterations in water availability or loss of species caused by a number of different developments, including population growth, the construction of water infrastructures or climate change (WOHL, 2010). In consequence, RBOs increasingly require capacities to manage the impacts of such environmental changes.

Hydropolitics research addressing adaptation within international river basins has so far primarily attributed differences in adaptation capacities to the design of water treaties which RBOs are based on (E.G. FISCHHENDLER, 2004; DRIESCHOVA, GIORDANO, AND FISCHHENDLER, 2008; DINAR, ODOM, MCNALLY, BLANKESPOOR, AND KURUKULASURIYA, 2010; DE STEFANO ET AL., 2010; ZENTNER, 2011; DINAR ET AL., 2015). They argue that water treaties which include flexible instead of fixed water allocation provisions or provide mechanisms for amendment or alteration are more adaptation friendly than treaties which do not include such flexibility mechanisms.

Only little attention has so far been paid to additional factors that could potentially influence adaptation capacities of international RBOs (SCHULZE AND SCHMEIER, 2012). This research points to the potential role international financing institutions (donors) can play in this context. This is particularly relevant with regard to the prominent role of international donors in regions of the Global South. In areas such as Southern Africa or South-East Asia international donors have become important players by facilitating the establishment of new RBOs as well as providing technical and financial support to existing RBOs (ALAERTS, 1999; KLIOT, SHMUELL, AND SHAMIR, 2001; LAUTZE, GIORDANO, AND BORGHESE, 2005; MOSTERT, 2005; LAUTZE AND GIORDANO, 2007).

Although there has been some scholarly work within hydropolitics research on the influence actors external to a respective river basins play, international donors have only received limited attention within this research (E.G. NAKAYAMA, 1997; MOSTERT, 2005; SALMAN, 2011). In the context of environmental change and adaptation, the role of donor organizations has not been considered much at all.¹ The paper therefore addresses the question of how and under which conditions international financing institutions support adaptation capacities of RBOs. It does so, by looking at two empirical case studies, including the Orange-Senqu and the Orange-Senqu River Commission (ORASECOM) as well as the Cubango-Okavango Basin and the Permanent Okavango River Basin Water Commission (OKACOM).

¹ One exception being Schulze and Schmeier (2012) which briefly touch upon the role of donors within a larger framework they developed.

After briefly outlining the methodological approach in the next section, the paper will provide a definition of adaptation capacities of international RBOs and further operationalize this definition. In a next step, the links between international donor organizations and RBO adaptation capacities as provided in the existing literature will be outlined. The main part of the paper will then be devoted to empirics and analyze the role of international donors within two Southern African River Basins and their respective RBOs – the Orange-Senqu and ORASECOM as well as the Cubango-Okavango Basin and OKACOM.

2. METHODOLOGICAL APPROACH

The paper's research interest is to identify whether international donor organizations influence RBOs' capacities to manage changes within the natural environment of international river basins and to identify potential factors that support or hinder the provision of these capacities. Due to the lack of standardized data on international RBOs and the primary interest of identifying causal links between an RBO's adaptation capacity and the activities of international donors, the study follows a qualitative and comparative case study analysis. The paper focuses on the region of Southern Africa² which depicts a relatively high number of international river basins that are of high socio-economic relevance for the basin states and, at the same time, experience growing environmental changes that the ecological resilience of these water bodies.

The two case studies, including the Orange-Senqu Basin and ORASECOM as well as the Cubango-Okavango Basin and OKACOM, have been chosen because they are typical cases (GERRING, 1970, PP. 648–50) within the Southern African region and hence are comparable on certain relevant characteristics that are shared with the majority of Southern African RBOs. As such both RBOs are first of all coordination-type of RBOs.³ Accordingly, both have a comparable slim institutional structure and (consultative) mandate. Both RBOs furthermore refer to one specific river basin that is shared by the member states (as opposed to general water body agreements that relate to more than one watercourse). Both RBOs furthermore exhibit a relatively high

² Southern Africa is here defined along the borders of the Southern African Development Community (SADC). SADC as a political organization was established in 1992 by ten African nations and has since grown to fifteen member countries (Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Seychelles, Swaziland, Tanzania, Zambia, and Zimbabwe). The overall objectives of the SADC are an increasing political and economic integration of the region.

³ One can generally distinguish between two types of RBOs (Schmeier, 2010): A *coordination*-type and *implementation*-type of RBO. RBOs with an implementation mandate are typically responsible for the development and maintenance of joint projects and hence equipped with more powers and resources. Coordination-oriented RBOs on the other side are responsible for coordinating different river basin management task, including the oversight or monitoring of joint projects, without necessarily implementing these themselves. Whereas the first type of RBOs requires larger budgets and staff numbers to ensure the full operation of the respective infrastructures, the latter are usually leaner organizations with fewer staff and much smaller budgets.

degree of institutionalization. As such, they do not only include regular representative and working group meetings but also comprise a permanent secretariat that serves as a coordination unit and fulfills RBO-related administrative work.

Despite their similarity with regard to their institutional structure and, to some degree, contextual factors, both RBOs significantly vary on their capacities to address environmental changes. The first case study ORASECOM has a significantly larger influence on adaptation and the resilience of the respective river basin than the second case OKACOM.

The analysis of the two case studies is based on document analysis, primarily relying on the RBOs' founding documents (treaties), policy and technical reports from the two RBOs, as well as 40 semi-structured expert interviews the author conducted in Southern Africa between July 2011 and June 2012. Experts interviewed from RBOs included members of commissions (representatives of the respective national ministries), technical bodies (such as technical task forces) and the permanent secretariats, all of whom are involved in decision-making procedures and, sometimes, in the implementation of RBO related activities. Furthermore, representatives from different basin stakeholder groups, including NGOs, donor organizations and researchers as well as private consultancy corporations, have been interviewed. NGOs have been consulted as they are often impacted by decisions made at the RBO level and, even more importantly, critically assess the work of RBOs from an outside perspective. Furthermore, bilateral donor organizations such as the German implementing organization Gesellschaft für Internationale Zusammenarbeit (GIZ), the Swedish International Development Cooperation Agency (SIDA), the United States Agency for International Development (USAID) as well as international funding institutions like the Global Environmental Facility (GEF) have been consulted as their involvement in the work of RBOs is the central interest to this study. Finally, researchers and representatives from different consultancy companies have furthermore been interviewed because these actors are often commissioned to conduct particular studies or provide training courses for RBO staff. They have therefore been considered to possess special technical expert knowledge relevant for this study.

3. DEFINING ADAPTATION CAPACITIES

Considering the large amount of literature on adaptation and related concepts such as vulnerability and resilience, it is beyond the scope of this paper to provide a thorough discussion on any definition of adaptation and adaptation capacities. However, there is a need to clearly define institutional adaptation towards environmental change in order to provide a basis for further operationalizing the term as well as to compare research results with other studies on the same subject. Based on the existing literature on adaptation (E.G. GALLOPÍN, 2006; SMIT AND WANDEL, 2006), adaptation capacities of an RBO are here defined as:

The ability of an organization to absorb changes or re-organize institutional structures if necessary and secondly, develop, coordinate and implement measures in order to avoid or mitigate negative impacts of environmental change on the river basin's ecosystem and/or riparian populations.

Adaptation capacities are therefore expected to be at least partly determined by RBO resources and institutional attributes that contribute to mitigate or avoid negative impacts of environmental change and might also require a change in institutional structures.

This understanding is based on parts of the global change and climate change literature which understands adaptation as being determined by the adaptation capacities a system or part of a system possesses – basically referring to a set of available resources (e.g. economic, institutional, social) – that can be mobilized to react to change and mitigate or avert its impacts (E.G. SMIT AND WANDEL 2006, NELSON, ADGER, AND BROWN 2007). Adaptation capacities are thus understood as a precondition that enable adaptation (NELSON, ADGER, AND BROWN 2007, P. 397-397) but at the same time can be shaped a product of adaptation processes (SMIT AND WANDEL 2006, P. 287-287). In the context of this paper the role of international financing institutions in potentially shaping these capacities will be examined.

Furthermore, to be able to assess whether an RBO contributes towards adaptation the term will be further operationalized along two dimensions: Firstly, *environmental protection*, which comprises preventive measures to protect environmental resources as well as measures to mitigate the impacts of major environmental disturbances like water pollution, biodiversity loss, invasive species or major changes of water flow regimes, that threaten the resilience of international river basins. Potential measures employed by an RBO to contribute to this dimension of adaptation are multiple: they can include contributions to improving the knowledge of river basin resources (e.g. through monitoring of key river basin indicators), the establishment of specific policies, guidelines or standards for the exploitation of river resources (e.g. in form of environmental assessments guidelines), or specific programmes or projects that help to protect river basin resources and ecosystems. The contribution of an RBO towards environmental protection of a river basin will therefore be based on an analysis of the RBO's contribution towards a healthy state of the environment.

Assessing adaptation will secondly comprise contributions towards *livelihood development* of basin populations. Livelihood development relates to the prevention or mitigation of negative impacts of environmental changes such as for example, the extinction of river species (such as fish which are important for income-generation), flood and drought protection measures, as well as different opportunities derived for the social and economic well-being of basin communities, such as water provided for irrigation or industrial purposes.

Furthermore, based on more general concepts of institutional performance from the international regimes literature (WETTESTAD, 1999, PP. 9–11; UNDERDAL 2002), one can distinguish between different dimensions of adaptation capacities an RBO could potentially contribute to: It can influence the behavior of relevant actors regarding responsiveness towards environmental changes in the river basin (outcome level)

which, subsequently, can lead to changes in the state of the environment and the connected livelihood conditions of riparians within the basin (impact level). Because of the lack of coherent basin-wide data as well as the obvious existing time lags between RBOs actions and actual impacts, this study focuses on the outcome level of adaptation.

4. THE ROLE OF INTERNATIONAL FINANCING INSTITUTIONS IN RIVER BASIN ADAPTATION

International financing institutions/donors have long played a major role in transboundary water governance. Donors are important actors fostering the formation of transboundary water institutions (such as RBOs) as well as financing and implementing transboundary water projects (E.G. ALAERTS, 1999; KLIOT ET AL., 2001; LAUTZE ET AL., 2005; MOSTERT, 2005; KLAPHAKE AND SCHEUMANN, 2006; LAUTZE AND GIORDANO, 2007; SCHMEIER, 2013). The reasoning for international donors to get involved in the regional governance of transboundary rivers and lakes and in this respect to interact with RBOs is the nexus of transboundary water issues with a broad range of developmental aspects as well as their strategic relevance for regional security. As such donors perceive the cooperation around transboundary water courses as a possibility to decrease tensions and improve cooperation between states, a means to contribute to socio-economic development and poverty alleviation as well as the protection of environmental resources (E.G. ALAERTS, 1999; GERLAK, 2004; MOSTERT, 2005; BMZ, 2006; IUCN, 2012).

For instance, Scandinavian and German donor organizations have supported the establishment of RBOs in Southern Africa, such as the Zambezi Watercourse Commission (ZAMCOM), and provided financial and technical support to the operation of RBOs and diverse river related programs in the region. The International Bank for Reconstruction and Development (IBRD or “World Bank”) as one of the most important international development organizations has significantly promoted the establishment of the Indus Water Commission (IWC) and the Nile Basin Initiative (NBI) and financed RBO infrastructure projects in a number of international watercourses. Another example is the International Union for Conservation of Nature (IUCN), a globally acting non-governmental environmental organization, which has supported the establishment of RBOs in several basins, such as the Volta Basin Authority (VBA), and provides support to a number of existing transboundary organizations. Because of this strong engagement, some authors have asked the question whether the formation of some RBOs can be reduced to the presence of international donors (SWAIN, 2012, PP. 52–54).

Donors have also set up specific adaptation financing mechanisms to help developing countries in acquiring the financial resources needed for implementing adaptation

projects – however, largely focusing on climate change adaptation exclusively. For instance, the United Nations Framework Convention on Climate Change (UNFCCC) Adaptation Fund is available for developing countries in order to finance projects allowing for adaptation to climate change consequences. In addition, bilateral donors have developed official development assistance (ODA) mechanisms focusing specifically on climate change-related projects. For example Germany's International Climate Initiative (ICI) provides funding to projects focusing on climate change mitigation, adaptation and biodiversity projects.

Bearing in mind that adaptation often requires additional resources, such external financing can provide the necessary funding for adaptation projects that is otherwise not available. Beyond pure financing, international donors can furthermore help to implement certain environmental and social standards which support adaptation capacities in international basins. It is therefore assumed that the involvement of international donors can provide additional resources as well as knowledge that support an RBO's adaptation capacities.

At the same time previous research has shown that the normative focus of external donor involvement has shifted over time from focusing on socio-economic development during the 1960s to 1980s (often referred to as *hydraulic mission*) towards more environmental conservation and integrated basin management since the 1990s (LAUTZE, GIODANO AND BORGHESE, 2005; LAUTZE AND GIRODANO, 2007; CONCA, 2006).⁴ In line with this observation, a high dependence on international donor assistance could be argued to lead RBOs to shift the focus on adaptation needs perceived as important by those external actors which, however, do not necessarily correspond with existing requirements at the particular river basin level. It is therefore argued that RBOs' capacities are increased if external donor support in the form of technical and financial assistance is in line with identified adaptation needs.

Finally, a high reliance on external resources can undermine ownership and consequently the long-term sustainable functioning of RBOs (SCHMEIER, 2013, P. 99–99), particularly considering that international water paradigms as well as donor interests and capacities do change over time as outlined above. It is therefore finally assumed that a high reliance on external donor support, without adequate funding from other sources (such as membership contributions or through RBOs generated income), decrease an RBOs' capacities to adapt to changes in the river basin.

The above outlined assumptions will now be analyzed along the two Southern African river basins and their respective RBOs. It will be shown how international donors have engaged in their work and, in particular, how they their engagement has supported and/or hindered adaptation to environmental changes.

⁴ In particularly international and western environmental NGOs and advocacy groups have played a prominent role in the anti-dam movement, thus slowing the economic development paradigm, and the spread of more environmental-protection oriented norms which can partly explain the more cautious lending of western donors for large-scale water infrastructures in during the 1990s and 2000s (Conca, 2006, Chapter 6).

5. CASE STUDY I: THE ORANGE-SENQU RIVER BASIN AND ORASECOM

ENVIRONMENTAL CHANGE IN THE ORANGE-SENQU BASIN

The Orange-Senqu Basin covers an area of almost one million square kilometers and is shared between the four countries Lesotho, South Africa, Namibia and Botswana. In global comparison, the natural river runoff, which is estimated to be around 11,500 million m³ annually, is relatively low and has been furthermore reduced through extensive use. As an important source of water for three of the strongest economically developed states in Southern Africa, South Africa, Botswana and Namibia, the area contributes 10 percent to the continent's GDP (HEYNS, PATRICK, TURTON, AND HEYNS, 2008, P. 376–376).

Extensive water uses by agriculture, industry and households have caused several human-induced changes in the biophysical environment in the basin. The most pressing change is the overall diminishing of water resources. Due to large water abstractions (mainly for irrigation agriculture) less than half of the natural river runoff actually reaches the river mouth and only 175 million m³ can still be allocated to further consumptive purposes (ORASECOM, 2013A, P. 3–3; ORASECOM, 2011B, PP. 9–10). This poses a problem for the growing economies of all four riparians which are in need of additional water for diverse uses such as irrigation purposes, hydropower generation and growing populations.

Closely related to the overall decrease in water resources is the change in flow regime, which has been seriously altered through numerous water transfer and storage schemes along the main tributaries (ORASECOM, 2008, P. 86–86; GRAFTON ET AL., 2013); causing a number of environmental problems, such as the loss of habitat of fish species or threatening the ecological functioning of the river mouth wetland (BORNMAN, ADAMS, AND BEZUIDENHOUT, 2004; PWC, 2005, PP. 15–17; ORASECOM, 2012, PP. 25–27).

Additionally, decreasing water quality caused by agricultural return-flows and urban waste waters as well as land degradation and increasing sedimentation has become a growing problem in many parts of the basin (E.G. TURTON, 2008; ORASECOM, 2010, P. 20–20).

Finally, climate variabilities and projected future climate changes are another major problem in the Orange-Senqu Basin. Climate change models predict an average increase in temperature in the second half of this century while rainfall is likely to moderately decrease in most parts of the basin (ORASECOM, 2011E, PP. 6–10). These changes are likely to influence the river ecosystem and economic opportunities of riparian populations. For example, rising temperatures expected in all parts of the

basin and reduced precipitation projected in the Middle and Lower Orange-Senqu more people will rely on irrigated instead of rainfed agriculture.

THE ESTABLISHMENT OF ORASECOM AND ITS CONTRIBUTION TO ADAPTATION

Based on the experience of a number of bilateral RBOs, the four riparians in 2000 established the basin-wide Orange-Senqu River Basin Commission (ORASECOM) with the objective to act as a technical advisor to its four member states on “matters relating to the development, utilization and conservation of water resources in the River System” (AGREEMENT, 2000). ORASECOM’s organizational structure has continuously developed over the years and currently comprises a Council (the highest decision-making body), a small Permanent Secretariat (providing general administrative, financial as well as some technical services) that is housed in Centurion/South Africa, and a number of different Task Teams which work on specific thematic issues (see Figure 1).

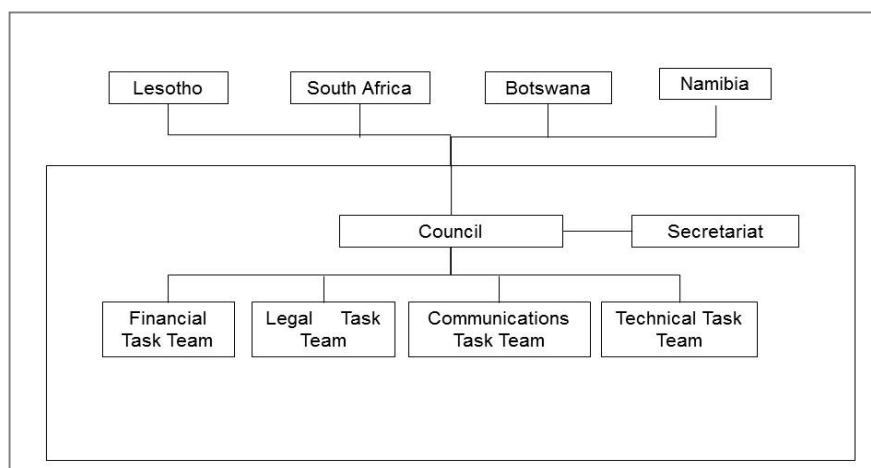


Figure 1: ORASECOM organizational structure

While ORASECOM showed relatively little activity during the first years of its establishment it has become much more active since the establishment of its Secretariat in 2006. Since then environmental protection, including proactive measures to avoid major environmental modifications as well as mitigating the impacts of environmental changes, has ranked high on ORASECOM’s agenda and constitutes an important part of its work.

Firstly, ORASECOM has contributed to improving the knowledge base about environmental problems and major environmental changes occurring in the basin. A Transboundary Diagnostic Analysis (TDA), a broad water quality and quantity analysis, has been conducted to identify major environmental problems of transboundary significance and their socio-economic consequences (ORASECOM, 2008; ORASECOM, 2013D). This report provided the basis for further studies into some under-researched environmental aspects that ORASECOM commissioned in the following years, for example on environmental flow requirements (ORASECOM, 2013C) or the hydrological modelling of the basin (ORASECOM, 2011C; ORASECOM, 2011B).

Following this first phase of knowledge-generating activities, the commission has furthermore begun to address relevant environmental changes in the basin more directly. For example, ORASECOM has initiated an Aquatic Ecosystem Health Monitoring program and conducted a first Joint Water Quality Baseline Survey in 2010 which assessed key water quality aspects, including the ecosystem health, water and sediment chemistry and biological water quality (ORASECOM, 2010). The commission is currently conducting the second survey which will allow for some first judgment on the performance of ORASECOM.

Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) guidelines which were formulated in 2013 are another example of how ORASECOM is trying to address problems of environmental change (ORASECOM, 2011D; ORASECOM, 2013B). EIAs and SEAs are now mandatory activities prior to projects that have significant transboundary impacts. They require a description of the baseline environment, the magnitude of the envisioned programmes, their expected environmental and social impacts as well as an outline of provisions for mitigating such impacts. The guidelines furthermore make provisions for monitoring the effectiveness of mitigation measures. Most importantly, these guidelines include a detailed outline of notification procedures, describing the exact information that has to be provided by a party at different development stages.

Finally, ORASECOM has recently started to get involved in the implementation of projects on the ground. It has, for example, initiated a water conservation and demand management project in a South African municipality to save water resources. Another activity, a Rangeland Management Project in Lesotho, aims to decrease land pressures caused by livestock farming and the resulting land erosion through diversification of income generating activities (ORASECOM, 2011A).

While the RBO has contributed to the environmental protection dimension on adaptation, it has not made any significant contributions to improving the livelihoods of the basin riparians. While some projects like the above mentioned water conservation project in South Africa indirectly help to improve livelihood conditions (e.g. assisting to save money on water which can then be used for other public services) these contributions are only indirect and limited in nature.

Summarizing, one can say that ORASECOM has made achievements along the environmental protection dimension of adaptation but not so with regard to the improvement of livelihoods. Although it recently became engaged in projects on the ground, these primarily focus on improving environmental conditions and are likely to influence livelihood issues only indirectly. Whether these and how these activities of adaptation along the environmental protection dimension can be attributed to the engagement of international donors will be addressed in the next paragraphs.

THE ROLE OF INTERNATIONAL DONORS

Since its establishment, ORASECOM has heavily relied on external support in the form of technical and financial contributions from international actors. Over the years

ORASECOM received substantial support from a range of different donor organizations and international actors: Amongst them, the European Union (EU) which financed several studies and training courses to help ORASECOM to better define its mandate; the French Global Environment Facility (FGEF) which provided support for the establishment of ORASECOM's interim Secretariat; the United Kingdom Department for International Development (DFID), the Australian Department of Foreign Affairs and Trade (DFAT, formally AusAID) whom together with the German implementing organization Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Kreditanstalt für Wiederaufbau (KfW) have provided different capacity development and financial support to the commission as part of a broader Southern African Development Community (SADC) water program; as well as the International Commission for the Protection of the Danube River (ICPDR), which engaged with ORASECOM in a number of knowledge exchange activities and provided technical support.

Already during its early years and in particular for the establishment of ORASECOM's Secretariat, donors played an influential role. While during the first years after its establishment ORASECOM's structure was limited to regular Council and Task Team meetings without any permanent support structure, member countries soon saw the need to expand ORASECOM's institutional capacities and establish a permanent coordination body in form of a secretariat (ORASECOM (ORANGE-SENQU RIVER COMMISSION), 2003, 33–34). This need was underlined by a number of international donors, including GIZ, the EU and FGEF. They were willing to support ORASECOM only if the necessary coordination functions to ensure effective implementation of donor activities would be put in place (ORASECOM 2003, 11). In the year 2003 GIZ, on behalf of ORASECOM, therefore commissioned a feasibility study on the establishment of an ORASECOM Secretariat (ORASECOM 2003), followed by organizational recommendations on the exact structure, functions and funding of the Secretariat (GTZ, 2005). In 2006 an interim Secretariat was finally hosted on the GIZ premises in Gaborone before the permanent Secretariat moved to South Africa in 2007.

Externally funded programs still play an important role in the Orange-Senqu River Basin governance today and often contribute to adaptation activities. The two main donor programs currently supporting ORASECOM are the German (through GIZ)-led Transboundary Water Management in SADC Program (with contributions from the UK and Australia) and the UNDP-GEF Strategic Action Program (co-funded by the European Commission (EC)). The UNDP-GEF funded program was particularly important in identifying principal environmental transboundary threats in form of the TDA-assessment and subsequently, the development of a basin-wide action plan (SAP) which comprises different measures and activities to address these environmental problems. Equally important, the program included several environmental flow requirement studies, the development of EIA/SEA guidelines, and three demonstration projects on rangeland management and water demand management which are currently being implemented. Whereas the UNDP-GEF supports ORASECOM directly, the GIZ program has come through the SADC Water Sector. The program focuses on capacity building and has supported ORASECOM through a broad-range of measure such as for example the setting up of

ORASECOM's website, the development of a communication and education tool, and, furthermore, by funding a number of several technical studies or staff trainings on issues like water quality testing, environmental impact assessments, water law and negotiations as well as IWRM.

The First Joint Basin Survey (as outlined in the previous section), conducted in 2010 and supported through an earlier phase of the GIZ program, was one of the most important initiatives with regard to adaptation so far. Specific project achievements with regard to environmental adaptation included the development of joint assessment methodologies; the analysis of a broad-range of river-related health components on the whole river basin level, including the first assessment of Persistent Organic Pollutants (POPs) along the Orange-River Basins; and the engagement of different stakeholder groups through for example water quality assessment workshops.

Particularly the development of joint methodologies for sampling and assessing the different river-related water quality and biodiversity components has been considered valuable by basin stakeholders in order to generate jointly owned data. Furthermore, capacity development activities such as preparatory workshops, facilitated by GIZ and the ICPDR, that focused on the development of methodologies, staff trainings (e.g. the South African Scoring System SASS – a bioassessment method for rivers) or inter-laboratory benchmarking assessments have been highlighted by actors approached for this research.

Overall stakeholders from RBOs and national ministries expressed appreciation for international donor support without which none of ORASECOM's programmatic activities, including adaptation-relevant measures as outlined above, could have been realized. At the same time many actors voiced concern about the sustainability of external donor funding, recognizing that donor support is not sustainable and can easily break off. Nevertheless, ORASECOM seems to be aware of this danger of donor reliance as it has ensured to cover its core budget through membership contributions only.⁵

Considering the multiple efforts and actors involved in the basin, ORASECOM tries to ensure donor harmonization and alignment with local needs through two mechanisms: First, all donor related programs and related program staff are housed at the same office premises. This close proximity between donor-funded programs and the ORASECOM Secretariat allows continuous exchange and is crucial for guaranteeing the Secretariat's oversight over all program activities.

Secondly, two institutional mechanisms, a so-called Program Strategy Committee and several program related Project Steering Committees, coordinate the different donor activities. The Program Strategy Committee (sometimes also referred to as ORASECOM Strategy Committee), comprising of ORASECOM Commissioners and representatives of all international cooperation partners (ICPs) at the time active in the basin, meets about once a year. These Program Strategy Committee meetings are

⁵ ORASECOM operates with an annual budget of around 2 million South African Rand (ZRA) paid by all four members on an equal share. This core budget primarily covers ORASECOM's Secretariat costs.

hosted by the ORASECOM Secretariat and discuss possible future program interventions and developments of ongoing programs. This body seeks to ensure that donor programs are in line with identified needs, avoid duplications of programmatic activities and use synergies between different interventions. Secondly, each single ORASECOM affiliated program is guided by a Project Steering Committee which meets regularly to discuss program developments and achievements, as well as upcoming program activities. Similar to the Strategy Committee, these meetings are chaired by ORASECOM's Executive Secretary and are attended by the respective program manager as well as representatives from all four member countries.

Overall, it is found that donor involvement in the form of technical and financial support for capacity building and program activities has considerably promoted ORASECOM's development. Important projects with regard to addressing environmental basin problems, such as the first Joint Basin Survey or the SAP, could only be realized with donor support. Also the establishment of the commission's permanent Secretariat, which plays an important role in acquiring new funding sources (including those relevant for adaptation activities in the basin), has initially been supported by external donors.

Acknowledging this, the overall high reliance on donor support for the implementation of programs also raises questions with regard to the long-term sustainability of adaptation actions. Virtually all programmatic activities of ORASECOM rely on external funding. Once donors withdraw their commitment, the continuation of these activities is at stake. Ensuring the payment of its core budget (which does not provide funding for programs) through membership contributions can hence only be a first step in ensuring the long-term continuation of these activities.

6. CASE STUDY II: THE CUBANGO-OKAVANGO RIVER BASIN AND THE PERMANENT OKAVANGO RIVER BASIN WATER COMMISSION (OKACOM)

ENVIRONMENTAL CHANGES IN THE CUBANGO-OKAVANGO BASIN

The Cubango-Okavango River Basin is situated in a predominately semi-arid region of south-western Africa and is shared by Angola, Botswana, Namibia and Zimbabwe. With a basin area encompassing a region of approximately 700,000 km², the Cubango-Okavango is significantly smaller than the Orange-Senqu Basin. However, with an average river runoff of 10,000 million m³ both are comparable in water

volume (MCCARTHY AND ELLERY, 1998, PP. 165–166; PINHEIRO, GABAAKE, AND HEYNS, 2003, P. 106–106; SCUDDER, 2008, P. 82–82).

The main tributaries of the basin, the Cubango and Cuito River, rise in the highlands of Angola from where they flow in a southeast-wards direction for approximately 600 km before joining into one mainstream river, the Cubango, which forms the Angolan-Namibian border. The river then flows into Namibia where it is called Okavango River, and continues to flow through the Namibian Caprivi Strip before finally emptying eastward in Botswana in a vast swamp in the Kalahari Desert known as the Cubango-Okavango Delta. In years with high river flows, the Delta feeds the outflowing Boteti River which forms part of the Makgadikgadi Pans. The latter are also fed by tributaries from Zimbabwe, such as the Nata River, which effectively make Zimbabwe a riparian to the Cubango-Okavango River Basin (ASHTON, 2003, P. 167–167; PINHEIRO ET AL., 2003, P. 107–107).

The delta in Botswana is characterized by a unique habitat with an abundant number of fauna and flora providing the livelihood bases of many of the basins' inhabitants and attracting thousands of tourists per year. Therefore, the Cubango-Okavango Delta has been listed as a Ramsar wetland of international importance and recently been declared a UNESCO World Heritage Site.

In contrast to the first case study, the Cubango-Okavango Basin ranges amongst the least developed water bodies on the African continent and has to date only experienced very limited environmental changes. However, the future development options for the basin, including plans for hydropower generation and expansion of irrigation agriculture in upstream Angola and Namibia, inhibit different degrees of environmental changes in particular for the Okavango Delta in Botswana and are therefore highly contested between the basin states. If pursued as planned by both countries, these plans would result in significant river flow reduction in the Cubango-Okavango River Basin downstream (OKACOM, 2010A, PP. 153–154). Overall water abstracted for irrigation purposes could increase up to 3,800 million m³/annum in the next years which would account for more than a third of the average annual river flow and could hence only be realized through the construction of water storing dams (OKACOM, 2011B, P. 24–24).

The different activities envisioned by the upstream riparians will, depending on the degree to which they are realized, change the timing of water flow and also reduce the water inflow to the Cubango-Okavango Delta. Several impact studies that have been conducted predict that changes flow regime will have negative impacts on water resources availability and ecosystem functioning of the Cubango-Okavango Delta (IUCN, 1993; ELLERY AND MCCARTHY, 1994; CSIR, 1997; MURRAY-HUDSON, WOLSKI, AND RINGROSE, 2006; OKACOM, 2009). This is of major concern for Botswana as well as local and international environmental protection groups for whom the protection of the Cubango-Okavango Delta system is of high ecological importance (and in the case of Botswana also of economic significance).

Variabilities in the basin climate as well as projected long-term changes pose an additional problem. Geomorphological studies have shown that the basin's climate has

experienced significant changes over the last 50 000 years, mainly manifested in significant changes of flooding patterns (MCCARTHY AND ELLERY, 1998, P. 170–170; MCCARTHY ET AL., 2003). For the future, climate models predict increasing temperatures, causing changes in evaporation rates which could increase by 10 to 20 percent (ANDERSSON ET AL., 2006; MURRAY-HUDSON ET AL., 2006; MÜLLER, WAHA, BONDEAU, AND HEINKE, 2014). Predictions for rainfall developments, however, vary significantly between different models (HUGHES, KINGSTON, AND TODD, 2011). While some predict less overall rainfall, which in combination with rising temperatures would increase evaporative losses and reduce mean annual flow of the river (ANDERSSON ET AL., 2006) others expect an overall increase of rainfall between 0 to 20 percent which is expected to compensate for the increasing evaporation rates (WOLSKI, 2009). Because the scenarios presented by different climate models vary significantly, it is virtually impossible to make any predictions on the impacts climate change is going to have on the river ecosystem and economic opportunities of riparian populations – leaving riparians with high insecurities with regard to future developments.

THE ESTABLISHMENT OF OKACOM AND ITS CONTRIBUTION TO ADAPTATION

Realizing their diverging interests with regard to the development and protection of the Cubango-Okavango River Basin, Angola, Namibia and Botswana in 1994 decided to form a joint RBO and signed the Agreement on the Permanent Okavango River Basin Commission with the aim to advise the parties on “matters relating to the conservation, development and utilization of water resources of common interest to the Contracting Parties” (Agreement 1994, Art. 1)

The RBO comprises a Commission (the highest decision-making body at the inter-ministerial level); a Basin Steering Committee (fulfilling a technical advisory function to the Commission); a small Secretariat hosted in Maun/Botswana (providing administrative and financial services) as well as currently three technically focused Task Forces (Figure 2).

Similarly to the first case study, OKACOM has shown limited activity during the first years of its existence. However, after the end of Angola’s civil war in 2002 OKACOM became much more active and has since matured significantly. Regarding adaptation, OKACOM has contributed to improving the knowledge about the river basin and possible impacts of anticipated developments. However, OKACOM’s overall contribution towards environmental protection within the basin has not gone beyond this knowledge-generating step.

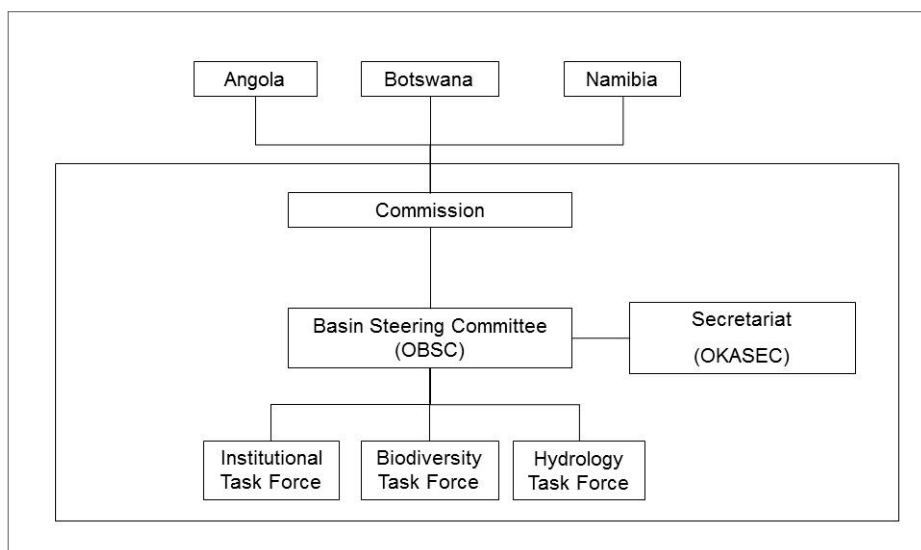


Figure 2: OKACOM organizational structure

One of OKACOM's most important projects, the Environmental Protection and Sustainable Management of the Okavango River Basin (EPSMO) project, aimed to identify major environmental threats and generated a huge amount of technical studies, of which many contributed to an integrated water flow assessment (OKACOM, 2009B).⁶ This assessment analyzed the relation between different water uses for socio-economic purposes and changes in hydrological flow with the ultimate objective of determining the range of environmental flows for the basin.

The major outcome of the project was a set of development scenarios of the river resources (comprising different dams and water abstraction scenarios that have been put on the table by riparian states in previous years) and predictions on the impacts these water uses would have on water flow and ecosystems. The assessment showed that under a high development scenario (which included all development plans along the whole river ever considered by the three OKACOM members) the river runoff at the entrance to the Cubango-Okavango Delta could be reduced up to 70 percent which would result in parts of the Delta completely drying out and causing damage on its ecosystem (KING, BEUSTER, BROWN, AND JOUBERT, 2014, PP. 794–795).

Another example of how OKACOM has contributed towards better knowledge about the basin water resources has been the development of the so-called water audit which, produced with the support of the Food and Agricultural Organization (FAO), includes the first comprehensive overview of available water supplies and abstractions in the whole Cubango-Okavango Basin (FAO, 2014). Prior to this water audit only rudimentary estimations of water supply and use existed on the basin-wide level (see ASHTON, 2003).

With regard to the livelihoods dimension of adaptation it was found that OKACOM has not made any contributions. Livelihoods of basin communities are closely linked

⁶ Most of these studies were produced by regional consultants, coming from local universities and research institutions such as the Agostinho Neto University, the Okavango Research Institute (ORI), or Namibia's Polytechnic.

to the Cubango-Okavango River Basin resources as people depend on incomes generated from fisheries, flood-recession agriculture and tourism. Unpredicted floods have therefore been a reoccurring problem, destroying crops, sanitation facilities and houses, and impacting the tourism industry.⁷ OKACOM has therefore attempted to act upon this issue through a Hydrological Data Sharing Protocol (OKACOM, 2010B). This Protocol requires the three parties to assist each other in providing ad hoc meteorological information for early-warning purposes in cases of droughts and floods. It furthermore stipulates to share specific hydrological data, for instance on water runoff, sediment transport and different water quality parameters, to be collected and published in form of regular monitoring reports by the Secretariat. Although this Protocol has been praised by other authors as a “key achievement” (SCHMEIER, 2013, P. 103–103) and promising “for the basin states’ capacity to collaborate and adapt” (GREEN, COSENS, AND GARMESTANI, 2012, P. 13–13), in practice OKACOM has failed to implement it. OKACOM’s Secretariat, which has a central role in this process, simply lacks the human resources to implement this role. The lack of technical staff (only the Executive Secretary has a technical water background) has left OKASEC without means to keep up with activities of collecting the required hydrological data from the member countries and prepare the required reports. An additional factor for failing to implement the protocol is the lack of measuring stations and consequently available river-related data on the Angolan part of the basin.

Overall, OKACOM’s contribution to adaptation in the basin along the environmental protection dimension has not moved beyond generating data and information while it has, similarly to the first case study, not contributed at all to the livelihood dimension.

THE ROLE OF INTERNATIONAL DONORS

The Cubango-Okavango Basin enjoys enormous international interest and has attracted a lot of international support. Beyond the support that the RBO received from bilateral donor organizations in form of technical and program support (compare OKACOM Annual Report 2011), OKACOM has also benefited from cooperation with research organizations. Despite the relatively huge number of actors involved in different activities in the basin and in the work of OKACOM itself, the RBO has so far failed to successfully coordinate the different donor-financed activities and to ensure harmonization between the different activities.

OKACOM receives a substantial amount of support from a range of different donor organizations and other actors: Amongst them the United States (through USAID) and the SADC which were crucial in increasing the RBO’s institutional capacities (for example through establishing OKACOM’s Secretariat); GEF and UNDP financed the EPSMO Project which ran from 2004 to 2010; Italy in cooperation with FAO

⁷ In 2010, for example, heavy rains and floods, destroyed crops, sanitation facilities and houses and consequently displaced at least 4000 families in the Angolan and 1000 families in the Namibian parts of the basin. These floods also impacted tourism industry in Namibia and Botswana as lodges had to be closed down temporarily (Okwenjani, 2010; OKACOM 2011a, p. 6–6).

supported OKACOM through the Cubango-Okavango River Basin Water Audit (CORBWA) Project which made important contributions to the knowledge on water yield and water use in the basin. One of the most important and influential donors is Sweden through the Swedish International Development Agency (SIDA) which has supported OKACOM since the early 2000s and has in particular sustained the activities of the OKACOM Secretariat since its establishment in 2008. SIDA has furthermore financed programs like the Every River Has Its People project, which facilitated cooperation amongst the different local stakeholders in the basin and helped to establish the Basin Wide Forum (BWF). The Swedish donor agency generally has a strong influence on OKACOM and decision-making processes. SIDA, for example, has a de facto permanent seat at the annual Commission Meetings (although this is not based on any official agreement).

International donors still provide substantial amounts of funding to the RBO's budget and contribute to important basin programs today, some of which directly contribute to adaptation and increased resilience of the river basin. For example, the already mentioned EPSMO project which facilitated the generation of important baseline data (overall around 60 technical studies produced by local research institutions) and major environmental threats, was entirely paid for through GEF funding (and implemented by UNDP). The EPSMO project has made central contributions towards adaptation by providing data on the state of the basin's resources and environment which are important to the riparian states in predicting environmental and social impacts of different water resources development projects. It hence provides a basis for discussion for ultimately agreeing upon a development space of the river basin resources that is acceptable for all riparians.

Another example is the UNDP-GEF's follow-up program – the *Cubango-Okavango River Basin Strategic Action Programme Implementation* (GEF, 2013) which focuses, among others, on the establishment of a sediment transport monitoring program. Considering that sediment transports is one of the most crucial components determining the functioning of the delta ecosystem (sediment loads regulate delta channel developments and therefore also influence flooding patterns and the distribution of water, plant and animal species), the monitoring of sediment transports is an important aspect for environmental adaptation.

Beyond donor-financed OKACOM projects, the RBO is also being approached by numerous other NGOs and research institutions that conduct research or other development programs within the basin but are not directly related to OKACOM. The latter are often pursuing joint research projects with international universities or other partners. Among the larger number of research programs currently being conducted in the basin is, for example, The Future of the Okavango (TFO) project, which is financed by the German Ministry of Education and Research (BMBF). TFO focuses on sustainable land use management across the Cubango-Okavango basin by conducting research in a range of different fields, such as the impact of land management and climate change on basin hydrology or the valuation of ecosystem services. The project is a joint and trans-disciplinary research project carried out by a number of German Universities and different Universities and research institutions from the Cubango-Okavango basin. Although this project is not an OKACOM project in the narrow

sense – it has neither been initiated by OKACOM nor is it based on a joint agreement – relations in form of regular consultations exist.

International NGOs like Green Cross International or IUCN and local NGOs like the Kalahari Conservation Society (KCS) or the Namibia Nature Foundation (NNF) are also active in the basin and often link up with OKACOM. IUCN for instance played an important role in the Cubango-Okavango Delta's listing as a UNESCO World Heritage site, as the organization is an advisory body to UNESCO. Similarly to Botswana's initiative to list the Delta as a Ramsar site as a result to Namibian plans to abstract water from the basin during the 1990s, this recent initiative can be understood as an attempt by environmental groups to prevent any major use of the Delta resources which could potentially cause environmental problems. As a major IUCN representative declared:

“The delta has recently faced threats including from extractive industries and World Heritage listing will hopefully help keep these challenges at bay” (IUCN, 2014).

The huge number of actors in the basin makes it extremely difficult for OKACOM to exercise an oversight function. Although the RBO is trying to work towards donor harmonization and alignment with its overall basin policy (which in form of the SAP identifies the main environmental protection and social development aspects) a functioning coordination mechanism to align the different donor-financed activities and to ensure donor harmonization is still missing. Several stakeholders mentioned that a lack of donor coordination in the past has resulted in duplication of activities. A number of programs for instance developed decision-support systems without building on one another or even referring to each other. Also attempts by the different donor agencies themselves to better coordinate their activities have failed.

Furthermore, OKACOM faces a similar danger as the first case study of sustaining its activities, including the ones necessary for adaptation towards environmental change, because of its large reliance on donor subsidies. The problem is even more significant for OKACOM as the RBO does not only rely on basin-external funding for its programmatic activities but also for its core funding.⁸ This reliance on external resources has shown to threaten the continuation of projects in the past. For example, when the official support for the EPSMO project ran out in 2010, OKASEC had to take over key project functions to ensure the completion of the project. This was neither foreseen in their annual planning nor was it really within the scope of their capacities. The secretariat thus had to take over additional tasks and responsibilities that further stretched their already limited resources.

Overall, international bilateral donors and donor agencies have provided important technical and financial support to the RBO and delivered the means for the implementation of all OKACOM programmes. The achievements OKACOM has so far made along the environmental protection aspect of adaptation would not have

⁸ OKACOM's annual core budget of 1.2 Mio USD has been entirely covered by SIDA until 2011. Only then the three member countries started making equal financial contributions (initially starting from 50.000 USD) which are planned to increase up to 400.000 USD by 2017.

been realized if such external support did not exist. However, as the analysis of the case furthermore shows, OKACOM could be more successful if it was able to better coordinate the different activities and donor programs and avoid waste of resources caused by a lack of donor harmonization. Finally, the large reliance on donor funding (although declining with increasing member country contributions) poses dangers to the long-term sustainability of funding.

5. CONCLUSION

The comparison of the two river basins and their respective RBOs, ORASECOM and OKACOM, shows that both contribute towards adaptation in their river basins – although to varying degrees and in both cases limited to the environmental protection dimension. The case studies also provide insights into how international donors influence adaptation capacities of RBOs to better respond to changes in the natural environment.

Looking at the aspect of both RBOs' adaptation capacities one finds that ORASECOM has made more significant contributions to better protect environmental resources and adapt to changes in the river basin than OKACOM. ORASECOM has significantly contributed to improve the state of knowledge on the river basin's resources and ecosystems through a large number of scientific studies and facilitating data and information exchange between the four riparians. It has furthermore become active in monitoring the state of the river basin's environment (such as on water pollution); established guidelines (EIAs/SIAs) for assessing environmental and social impacts of infrastructure developments; and finally initiated first projects on the ground to mitigate water-related environmental problems.

OKACOM's contribution to adaptation and an increased resilience of the Cubango-Okavango River Basin on the other hand has been much more limited. Its influence on adaptation has largely focused on improving the knowledge about the river basin and outlining impacts on the rivers water flow and ecosystem that are likely to result from anticipated developments. Although such knowledge is important to advise the river riparians on the most contested governance issue – namely whether or not to exploit the river resources and to which possible degrees – this improved knowledge has not been translated into any further activities. While the RBO has initiated some additional initiatives, such as the signing of the Hydrological Data Sharing Protocol which could potentially provide a means to establish an early-warning system for extreme weather events and hence a possible improvement of livelihood protection of basin communities, these have not (yet) been realized.

With regard to the role of international donors it was shown that these actors play an important role in the governance of both river basins and in providing the means to realize adaptation to environmental change. First of all, donor organizations deliver technical and financial support to both RBOs, important for capacity building (e.g. in form of the establishment of secretariats) and program activities that are relevant to

influence adaptation and resilience of both river basins (such as environmental monitoring programs). Being able to access such funding provided by donors is an important pre-requisite for adaptation in regions with limited national resources – confirming findings of previous research (SCHMEIER, 2011, P. 52–52).

The reliance on external donor funding however has also shown to be problematic, raising the question of the long-term sustainability of RBOs and their adaptation capacities as donor support can prove to be a relatively unstable source of funding (as has been shown for other cases as well, see KLAPHAKE AND SCHEUMANN, 2006). The termination or withdraw of donor support can seriously threaten the continuation of projects as the OKACOM case has shown. Taking into account that RBO member states in Southern Africa and in the developing world in general often have limited financial capacities, it is suggested that flexible financing mechanisms, including a mix of finance sources such as membership contributions, donor support, trust funds or own generated income (e.g. through payments for ecosystem services) could significantly contribute to the sustainable funding of RBOs and its adaptation activities.

Furthermore, the analysis also raises the question whether the focus on the environmental side of adaptation (and the neglect of livelihood aspects) reflects the interests and prioritizations of international donors (SEE ALSO MOSTERT, 2003, P. 6–6, LAUTZE AND GIORDANO, 2007). Considering the level of poverty amongst the basins' population and their vulnerability to floods and droughts (especially in the Cubango-Okavango case), investments in livelihood developments would be expected to be of at least similar national and regional priority. While both RBOs clearly articulate this objective of improving the livelihood conditions of basin populations, they have not made much progress in this regard. This observation raises the broader question about the influence of donors on RBO agendas and decision-making which should be focused on in future research.

Finally and complementary to other studies (MOSTERT, 2005, PP. 27–28, SCHMEIER, 2013, P. 99–99), the analysis furthermore suggests that the coordination of the different donor activities is another important aspect to ensure ownership and oversight of an RBO. Whereas ORASECOM has developed mechanisms to harmonize the different donor activities OKACOM lacks such a mechanism. In the latter case this has led to the duplication of activities and a waste of resources that could have been used for other adaptation relevant tasks. Additionally, in the case of ORASECOM the close proximity of donor supported programs and the ORASECOM Secretariat have helped to facilitate communication and ensured the RBO's oversight over all program activities.

Overall, one finds that the role of donors remains ambivalent. While they can provide important means for adaptation in form of knowledge, financial and technical resources, their involvement at the same, can threaten the long-term sustainable functioning of an RBO and in cases of basins with a large amount of donor actors raises the question of alignment of different activities and approaches. It is therefore important to examine the exact conditions under which donor involvement can support adaptation to environmental changes in a transboundary river basin. This

research suggests that some degree of diversification of funding as well as the presence of an RBO coordination mechanism for donor activities positively influences adaptation capacities.

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