

Title: Financing challenges for effective river basin organizations in southern Africa

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Abstract

In line with the Revised SADC Protocol on Shared WaterCourses, a number of river basin organisations (RBOs) have been established to manage shared water courses in an integrated and sustainable manner. Most RBOs are in their infancy stage and heavily dependent on ICP funding; countries contribute mostly to the operating costs of the RBO. The Protocol assigns some tasks to RBOs but is silent on funding mechanisms.

The paper will show that financial requirements of RBOs tend to grow in time and are determined by factors such as their mandate (advisory or inclusive of implementation), the number of member countries and the size of the basin. In-kind payments can be made to reduce the financial requirements, particularly useful for cash strapped economies.

Furthermore, the paper will show the development stages of RBOs and their associated activities and funding requirements. A wide range of funding sources and mechanisms are available, each with distinct advantages and disadvantages for each development stage of the RBO and type of activity. Sustainable funding of RBO development and operation requires a secure and balanced range of funding sources. Some of the financing challenges include reducing dependency on ICP funding, affordability and fair distribution of the costs among member countries and tapping into the resources of the private sector (e.g. investment) and resource users (the user and polluter pay).

The paper will identify the main financial challenges and make recommendations for enhanced and sustainable funding of RBOs in southern Africa.

The paper is based on a review of the general literature and a comparative analysis of case studies, including the Okavango, the Orange-Sengu, the Senegal, the Rhine and Danube River Basins.

The paper is based on a study carried out for SADC under the USAID Integrated River Basin Management Project, which is managed by Associate in Rural Development (ARD).

Keywords: Funding needs, sources and funding mechanism; river basin management; shared water resources.

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Abbreviations

CAR	Centre for Applied Research
ESKOM	Electricity Supply Commission
EU	European Union
GDP	Gross Domestic Product
GEF	Global Environment Facility
GTZ	Gesellschaft für Technische Zusammenarbeit
HDI	Human Development Index
ICP	International Cooperating Partners
ICPDR	International Commission for the Protection of the Danube River
ICPR	International Commission for the Protection of the Rhine
ISWF	International Shared Water Facility
LHWP	Lesotho Highlands Water Project
MoU	Memorandum of Understanding
MRC	Mekong River Commission
OKACOM	Okavango River Basin Water Commission
OMVS	Organisation pour la Mise en Valeur du Fleuve Senegal
ORASECOM	Orange-Senqu River Commission
RBMP	River Basin Management Plan
RBO	River basin organisation
SADC	Southern Africa Development Community
SAP	Strategic Action Plan
SIDA	Swedish International Development Cooperation Agency
SOGED	Societe de Gestion et d'Exploitation du barrage de Manantali
SOGEM	Société de Gestion de l'Energie de Manantali
TDA	Transboundary Diagnostic Analysis
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
ZRA	Zambezi River Basin Authority

1 Introduction

A large portion of global fresh water resources are contained in watercourses shared by two or more countries (Pochat, undated; Watkins, 2006). In the SADC region all major rivers are shared by two or more countries. Therefore shared watercourse management is vital for the region's development and environment.

Globally, there are 263 transboundary river basins, covering nearly half of the earth's land surface and crossing the territories of 145 countries. About 33 nations have over 95% of their territory within international river basins. (Wolf *et al* 1999; Bun, 2008). Such basins are home to forty percent of the world's population and generate around 60% of global freshwater flow (Wolf *et al*, 1999). Within the SADC region, about 70% of the region's water resources occur in shared river basins (Chiramba, undated).

The management of shared transboundary watercourses in the SADC region is guided by the Revised SADC Protocol on Shared Watercourses, which was signed in August 2000. The main intent of the Protocol is to foster closer cooperation for judicious, sustainable and coordinated management, protection and utilisation of shared water courses and advance the SADC agenda of regional integration and poverty alleviation (Article 2). Use of shared water resources is subject to the provisions of this Protocol¹ (Pochat, undated).

The Protocol provides for the establishment of institutions for the implementation of shared water management and states support for river basin commissions or RBOs (Article 5). However, the SADC Protocol does not specify the responsibilities of the RBOs other than providing regular progress reports and information. The SADC Protocol does not provide any details on funding requirements and sources of transboundary water management.

Progress has been made towards basin and sub basin wide management of shared watercourses: about 40% of the world's transboundary watercourses now have some form of cooperative management frameworks (Bun, 2008). Several challenges for river basin management in Southern Africa remain, including funding and financial sustainability. Many southern African RBOs depend on ICP funding. Therefore, this paper explores the funding requirements and sources of transboundary water management and RBOs and makes recommendations for long-term funding adequacy and security.

2 Methods and limitations

The paper is based on research carried out under the Integrated River Basin Management project, carried out by Associates in Rural Development for USAID. The component carried out by the Centre for Applied Research (CAR) was to establish guidelines for funding requirements and sources. The full report can be down loaded from www.car.org.bw. Further work is being carried out and therefore the results presented in this paper must be considered as interim results.

The study comprised a general literature review and in-depth case studies of six RBOs (Okavango, Orange, Mekong, Senegal, Rhine and Danube). In addition, a questionnaire was circulated among RBOs and stakeholders. While the response rate was disappointing, the returned questionnaires provided valuable additional insights. The mail questionnaires and interviews were used to collect data from International Cooperating Partners (ICPs), RBOs and SADC-Water

¹ The Revised Protocol on Shared Watercourses derives many of its provisions from the Helsinki Rules and the United Nations Convention on the Law of the Non- Navigational Uses of International Watercourses.

Division experts. An analysis of case studies of river basin organisations or commissions in southern and west Africa, Asia and Europe was undertaken drawing mainly from existing literature. The following major limitations existed for the study:

- The project was conducted in a short period, and therefore data collection and interviews have been limited;
- RBO and ICP financial and funding data are patchy, and their availability varies from RBO to RBO. This makes it difficult to derive an overall picture of the state of funding;

In line with the SADC Water Policy and Strategy, the study adopted Integrated Water Resources Management (IWRM) as its analytical framework. IWRM implies, among others, that water resources are treated as economic and social goods, raising issues of user charges, cost recovery and subsidies; that stakeholders should participate, hence water management should not be restricted to the public sector; and that resource management should be decentralised to the lowest relevant level. The IWRM implications for transboundary water resource management are that users and polluters need to pay for water consumption (subject to affordability and ecological sustainability), that RBOs should involve stakeholders in water management and that RBO water management needs to be fine tuned with national and local water management efforts of member states. These implications need to be reflected in the budget requirements and funding sources of RBOs.

RBOs in southern Africa date back no more than fifteen years, and most are younger. In Europe, some RBO are much older (e.g. the Rhine) and have developed and matured. The activities and funding requirements of such RBOs differ and therefore RBOs need to be classified based on their history and progress. RBOs are usually classified into three groups, based on their development process (ODI/ Arcadis, 2001; Hooper 2006): the initiation phase; the development or infancy phase and finally the implementation or full operational phase. Each phase is briefly discussed below.

- RBO initiation phase. The initial stage of establishing dialogue between riparian states through consultations and negotiations, leading to a memorandum of understanding and description of the responsibilities of the RBO secretariat and the member countries. . The time to reach an agreement ranges from up to ten years (Senegal, Okavango and Niger River Basins), to thirty years (Meuse, Incomati, Zambezi River Basins) and to hundred years (Alpine Rhine Basin) (Mostert, 2003).
- RBO establishment and development phase. This stage is characterized by establishing the RBO secretariat and the preparation of a transboundary diagnostic analysis TDA, Strategic Action Plan (SAP) or River Basin Management Plan (RBMP).
- RBO full operation phase. This stage includes the supervision and monitoring of the implementation of projects and activities contained in the TDA, SAP or RBMP. It may include the development of joint development and infrastructure projects (this is sometimes seen as the fourth stage). The Organisation pour la Mise en Valeur du Fleuve Senegal (OMVS), the Senegal RBO, is at this stage.

Most RBOs in developing countries are in Phases 1 and 2. In some cases, they have been preceded by several bilateral agreements in parts of shared water courses, which are in the implementation and operational stage. Examples include the Lesotho Highlands Water Project in the Orange-Senque river basin, the Kariba Dam agreement between Zambia and Zimbabwe in the Zambezi river basin and finally the Maguga and Driekoppies Dams agreement between South Africa and Swaziland in the Incomati river basin.

3 Findings

To-date funding of transboundary water management has attracted relatively little attention and RBOs receive a small part of the ICP funding. Out of the total development assistance (ODA) spent globally on water and sanitation (\$3.5 billion), less than ten percent is allocated to transboundary water resources (Watkins, 2006: 231; ODI/Arcadia Euroconsult, 2002). Recently, the RBO share of ODA has been growing.

3.1 Funding levels and requirements

Funding levels

Most budgets of RBOs are modest but they vary significantly. The operational costs of the RBO examined here range from US\$250,000 to US\$ 2 million. For example, the annual operational costs of OKACOM are estimated to be around US\$ 900,000 and those for ORASECOM are Rand 2 million. Elsewhere the operational costs of are US\$ 1.3 million for the Senegal and around US\$2 million for the Mekong. In Europe, such costs are € 700,000 to 900,000 for the Rhine and Danube respectively (Table 2). For most emerging RBOs, the funding level is increasing, particularly of the operating costs. In contrast, the budget for well established RBOs such as the Rhine and Danube is fairly stable.

RBO funding needs are also reduced by delegating project implementation to member states that are directly involved. This is common in Europe where the affected member states pay for RBO projects, which are of interest to them. Furthermore, member states often make in-kind contributions to their RBOs. For example, Botswana Government funded the office rent for OKACOM Secretariat (OKACOM, 2007). In addition, Mekong basin member states provide various types of in kind support to the MRC, including staff and office space, coordination, recruitment, administrative and logistical support for National Mekong Committees, provision of headquarters building and furniture, several tax and duty exemptions (MRC, 2005).

Funding requirements

Funding is necessary for the establishment and operations of the bodies of the RBO, for the preparation of TDAs, SAP or RBMP and for the actual implementation of projects and activities. Where RBOs are directly involved in infrastructural projects, large investments are required.

Funding is needed for the following activities:

- RBO operations and functioning. These are mostly the recurrent costs of the secretariat and of other RBO bodies (e.g. technical committees). The cost categories include professional staff salaries, equipment and vehicles, travel costs, RBO meetings, utilities bills, stationery and the internet. Salaries of staff members take up to 40 to 70% of the recurrent expenditures as shown by case studies: Danube ICPDR spends 56% of its recurrent budget on salaries; Rhine ICPR 74%, Mekong MRC 39% and OKACOM 47%. Some RBOs have a budget line for stakeholder participation and engagement.
- RBO plan development. These are the costs of developing TDAs, SAPs or RBMP as well as river basin strategy (US\$ 5-6 million for OKACOM and ORASECOM). Funding is also required for other studies such collection of river basin baseline information.
- Plan implementation activities. This refers to all activities that are part of the plan. Activities include monitoring and evaluation of projects activities, training and skills

- development. Some or most activities may be directly implemented and funded by member states (the practice in Europe), and therefore not all activities in this category are funded through the RBO.
- Joint infrastructure development and management. This refers to specific projects such as dam construction, canalisation of rivers, flood protection and drought mitigation activities. These are determined by the specific TDA or SAP and their number and size varies considerably among RBOs. For example, the Senegal RBO, OMVS, spends significant financial resources on infrastructure projects (US\$ 800 million for two dams and US\$ 450 million for a hydropower station; see Table 2).

Funding mechanisms

The literature discusses several financing mechanisms (i.e. instruments) such as water and service charges, private sector investments, endowments or trust funds, ICP grants, permits or allowance based contributions (Danish Water Forum, 2007; ODI & Arcadis Euroconsult 2001). The major funding mechanisms are briefly discussed below. More empirical work is needed to evaluate the advantages and disadvantages of each. Currently, most RBOs depend on public funds from member states and ICPs. In countries with advanced environmental policies part of the funding is recovered from resource and pollution charges (e.g. Europe).

- *Charges.* Three types of charges exist, but they are not commonly used as yet: charges for resources, pollution and services provided by the RBO. User and pollution charges have increasingly been adopted in national environmental policies based on the user-pays and polluter-pays principles as well as cost recovery concerns. The French *Agences de Bassin* levies charges on pollutant load discharges to surface water, the revenues from which both support the *Agences* themselves and are used to subsidise industry and municipalities in river clean-up programmes (ODI & Arcadis Euroconsult, 2001). Member countries with well developed environmental policy finance ‘their’ RBO projects from water use and pollution charges (e.g. Rhine). The main advantage for levying charges is that they generate revenues and encourage efficient resource use and/or pollution reduction. However, taxes and charges are sometimes complicated and expensive to administer due to institutional difficulties and only suitable for transboundary river commissions in regions with well developed environmental policies (ODI & Arcadis Euroconsult, 2001). However, a small shared water levy for large water consumers such as water providers and large irrigation projects appears feasible and could generate significant income for the RBOs. Some RBOs have started charging for services such as project overheads, supervision and affiliation. This assists them in recovering the recurrent expenditures.
- *Public funding* originates from general taxation, either from member states or from other countries (through aid). State contributions for the operating costs of RBOs are commonly sourced from general taxes. Public financing demonstrates governments’ commitment to RBOs. However, government budget deficits and political factors may threaten public funding of RBOs.
- *Private sector investment* in transboundary water resource management has been limited mainly to development of hydropower generation infrastructure (ODI & Arcadis Euroconsult, 2001). Lack of private sector investment is mainly due to lack of a medium through which it could channel its participation. In addition, the private sector needs a range of incentives such as potential profitability and return on capital as well as manageable risks such as political security. Danube River Basin is financially and technically supported by the Coca Cola Company. Electricity Supply Commission (ESKOM) manages hydro-electricity in the Senegal River Basin (JBIC Institute, 2008).

- *Funds* can be established for funding of programmatic activities such as those from the TDA. The funds can be used as an endowment or Trust fund (only the incremental funds are used for financing) or as a regular fund. In the regular fund or basket fund model, member states, ICPs and other stakeholders regularly contribute to the fund, ensuring adequacy and coordination of funding. In the endowment fund model, the RBO invests the fund capital and use the earnings from the investment to fund desired programme (ODI & Arcadis Euroconsult, 2001). The Nile basin has a trust fund that coordinates ICP contributions and RBO activities. Trust funds provide long-term financial security for transboundary river institutions. They encourage participation of stakeholders such as NGOs, commercial sector and ICPs because they are managed by a board of directors (ODI & Arcadis Euroconsult, 2001). A proposal has been made for a special form of a global water fund, i.e. an International Shared Water Facility (ISWF), which would target RBOs and be similar to the global environmental facility (GEF).
- *Inter-riparian financing* involves investments made by some riparian state(s) in the territory of another member state that yield better returns as compared to any other option and the riparian states would share the benefits accrued based on an agreed percentage formula (ODI & Arcadis Euroconsult, 2001: 28). The Lesotho Highland Water Project also provides a good example of inter-riparian financing.
- *ICP funding* is a special case of public funding and inter-government transfers. The advantage of ICP funding is that it does not pose a financial burden on member states and often is given in the form of grants. Disadvantages include that ICP funding is insecure and may change with changing ICP priorities. Moreover, the risk exists that RBOs become dependent on ICPs and that member states become less committed to RBOs. Finally, the transaction costs of ICP funding are high due different procedural requirements of each ICP.
- *Loans and grants*. Concessionary loans and grants can be obtained at a relatively low cost through government to government agreements and are normally designed to benefit the disadvantaged groups. Funding in terms of grants, is transparent and simple, it avoid repayment obligations and debt overhang. They can also be blended with other kinds of finance to produce a suitable financing package for a particular project, but grants may also carry political and commercial obligations (CAP-net, 2008a). Commercial loans are available from private banks. They are only available for those operations or activities that can generate resources or savings that can be used for repayment purposes (Anonymous, undated: 48).

3.2 Funding determinants

Above, the funding requirements were reviewed. Here, the question is addressed what determines requirements for core RBO funding (3.2.1), funding of plans and activities (3.2.2) and funding of infrastructure projects that the RBO may be involved in (3.2.3).

3.2.1 Core RBO funding

The determinants of core RBO funding are expected to be the following: stage of the RBO, features of river basins and member states and finally the mandate, size and organizational structure of the RBO. Each potential determinant is discussed below.

Stage of RBO

Globally, RBOs are at different stages in their development. The Rhine ICPR and the Senegal RBO are well established and in the implementation phase (the latter with joint infrastructure projects). The other RBO case studies all date from the 1990s and are in the development phase.

The costs increase during the development of the RBO with the establishment of the secretariat but appear to stabilize during full implementation once the organizational structure has been established and functions well (e.g. Rhine and Danube).

Without a secretariat and plan preparation, the initial phase of the RBOs requires limited funds; at this stage costs are associated with negotiation and consultation of stakeholders. The duration of the negotiations and consultations influence the costs. The Nile Basin Initiative is estimated to have cost over US\$ 10 million (ODI & ARCADIS, 2001).

In developing countries international ICPs and banks often carry the management cost of negotiating an international treaty, but they also finance river basin commissions and research projects for a longer time, and give loans for specific projects (Raadgever *et.al.* 2008).

The international ICPs facilitate and finance the establishment of most of RBO Secretariats in southern Africa. The Okavango RBO (OKACOM) is in this second stage. SIDA facilitated the negotiation workshop and the development of a manual outlining the steps towards the consolidation of the secretariat and the eventual functioning of the secretariat (OKACOM, 2007). USAID also contributed to the establishment of OKACOM Secretariat. GEF is currently funding a Transboundary Diagnostic Assessment (TDA). The establishment and institutional development of the Orange-Senqu River Basin Commission (ORASECOM) was undertaken with financial support of Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). GTZ also hosted the secretariat and paid staff salaries in Gaborone before it was relocated to Pretoria.

River basin and member state features

Physical factors such as number of member states, size of the basin and the length are expected determine funding requirements. Governance and development factors may also impact on the RBO budgets. The former cannot be changed and must be incorporated; the latter however can be influenced by member states and regional organisations such as the EU and SADC to improve the RBO and states' capabilities and costs.

With respect to physical factors, the comparison of different river basins shows that factors such as the number of member states and the size of the basin area seem to (co-) determine the level of funding of RBOs, although the relationship is not straightforward. The large Mekong river basin (800,000km² in size) is associated with higher MRC operation costs than those of other river commissions. While the Orange-Senqu basin size is bigger (1 million km²), its operating costs are lower than those of MRC, mainly because the ORASECOM Secretariat only started operating in 2008 (Tables 1 and 2). Another example for Europe, the Danube secretariat has a larger budget than that of the Rhine because of the difference in number of member states (14 compared to 4) and the size of the basin (800 950 km² compared to 162,500 km²).

With respect to development and governance factors, the member states' level of development, cohesion-diversity and governance are likely to influence their capability or willingness to fund RBOs. Cohesion-diversity relates to the states working together and governance relates to the manner of government. With reference to cohesion-diversity, the state of regional cooperation helps coordination of the RBO including issues of funding. The Rhine basin states have long history of cooperation and trust and are influenced by the legally binding EU Water Framework Directive (Raadgever *et al.*, 2008).

The level of development and governance have been measured with the Human Development Index (0 to 1) and the governance index (-2.5 to + 2.5) respectively. An index of 1 means a country is highly developed and an index of 0 denotes less development. Governance is measured

on a scale; a measure of 2.5 denotes good governance -2.5 means poor governance. These factors are discussed below.

There are several dimensions of governance including voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption (Kaufmann *et al* 2009). The ²governance dimension used here is political stability and absence of violence. This dimension captures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism (Kaufmann *et al* 2009). The dimension is not necessarily more important than other dimensions but was chosen assuming that unstable government are unlikely to prioritize transboundary water management and make transboundary water management more difficult. It is assumed that more homogeneity in development and governance among member states facilitates (and accelerates) effective transboundary water management.

The Rhine river basin states fall in the high HDI category and have stable political systems. The Rhine river basin states finance the work of ICPR from public resources; activities such as studies are borne by member states in which such activities are carried out. In contrast, member states of RBOs in developing countries fall within medium and low human development categories and there is significant disparity between the member states in terms of governance and human development. For instance, in the Nile river basin the highest governance dimension is 0.01 and the lowest governance dimension is -2.44 (Figure 1).

Human Development Index (HDI) measures human development in a country. HDI measures the average achievements in a country in three basic dimensions of human development: a long and healthy life; access to knowledge; and a decent standard of living (UNDP 2007: 225). With reference to RBOs in developing countries, some member states fall within the medium HDI whereas some are in the lower HDI; none falls in the high HD category.

According to Klaphake and Scheumann (2006), national political-administrative systems strongly shape international water cooperation. Thus, national political systems influence states actions towards shared watercourses. However, common problems or interests can also foster cooperation amongst riparian states despite their low HDI and governance. The Senegal River basin is a classic example. The shared interests to acquire, all year navigation, water hydro-electricity and irrigation influenced member states to jointly develop and manage infrastructure. The cooperation of member states enabled them to acquire ICP or external assistance. Figure 2 shows that Senegal River basin member states' HDI and governance measure are low but nonetheless the states have undertaken joint infrastructural development projects.

Mandate, organisation and size of the RBO

The level of RBO funding is also determined by the RBO tasks and authority and the stage of development of the RBO. An 'advisory' RBO will have a lower budget than a RBO that also implements projects or develops and hosts a data base. Currently, most RBOs in SADC are advisory and decisions are taken by member states.

The mandate of OMVS includes making policies and regulations for project implementation and to determine the water resource allocation and benefit sharing in the Senegal basin (AMCOW and

² Most sources measures of governance identify six dimensions to measure quality of governance. Governance is complex therefore all six dimensions are equally important and ICP agencies as well as international financial institutions. This study's use of one dimension, political stability and absence of violence does not undermine the importance of other dimensions.

ANBO, 2007). Through the OMVS, the three riparian states of Senegal, Mauritania and Mali have agreed to jointly undertake infrastructural development. The OMVS has developed three major infrastructural developments, i.e. the Diama Dam, the Manantali Dam and the Manantali Hydro-electric project. These developments cover the OMVS assignment of dam construction, hydro-electric production and anti-sea water in-land intrusion (Lautze *et al*, 2005).

3.2.2 Funding determinants of plan preparation and implementation

The size of the river basin, length of the river and the number of member states will determine the level of funding for preparation of preparation of TDA and IRBMP. Larger river basins with many member states will require more funding for obvious reasons. The need for cover extensive areas during data collection, consultation and ensuring participation of stakeholders will require more human and financial resources. The total number of member states determines funding in that the number of stakeholders and administrative costs will increase proportional to the number of member states.

3.2.3 Funding determinants of infrastructure projects

The type and size of infrastructural project and the number of interested states in a particular project determines funding. Common infrastructural projects in shared transboundary watercourses include; dams, hydro-electricity, irrigation, flood control, and water transfer schemes. The number of targeted beneficiaries in basin states also determines the level of funding of infrastructural projects. The size of infrastructural development project is proportional to funding level.

3.3 Funding sources

There is a close link between funding mechanisms (discussed above) and sources. This section reviews the main funding sources of RBOs. Funding sources can be public (government), private sector (enterprises and domestic users), financial institutions and ICPs. They can be national (e.g. member state contributions), regional (e.g. EU contribution to RBOs in Europe and support from regional development banks) or global (e.g. foreign direct investment and ICP assistance). It is necessary to recognise indirect and direct sources of funding. For example, state funding may be retrieved from resource users through charges. Also, ICP funding is 'indirect' public funding from ICP countries. Each source is briefly reviewed below.

ICPs

ICP funding may be justified on the ground of transboundary water management being an international public good, contributing to regional peace and security, as well as for poverty reduction and environmental sustainability (Watkins, 2006). Moreover, maintenance of transboundary river basins protects their existence value and long term security (aid is sometimes viewed as a proxy for the international existence value). Finally, ICP support supports transboundary water management where the poorest countries cannot contribute sufficiently. ICP funding is high in evolving RBOs in developing countries, particularly during the inception and establishment phase (GTZ, 2008). International ICPs provide financial support for specific activities; these include developing cooperative institutions, operations of a river basin organisation, data sharing and information management. ICP support is not evenly distributed among RBOs and there is sometimes competition among ICPs. Moreover, differences in administrative procedures lead to significant extra costs for the RBOs. ICP coordination and harmonisation of ICP activities is essential, for example through a basket fund approach. Views differ as to the feasibility of ICP coordination.

GTZ played major role in establishing the ORASECOM secretariat. SIDA and USAID funded (US\$256,333) the six months start-up phase of Okavango river basin Secretariat. RBO require funding to undertake Transboundary Diagnostic Analysis (TDA) or River Basin Management Plan RBMP. Okavango TDA is funded by UNDP/GEF (US\$5.7million) and the cost of Orange-Senqu TDA is US\$ 6 million and the IWRM plan is funded by GTZ (€ 4 million; see Table 2).

Most RBOs in developing countries depend on ICPs for funding. In most African transboundary water resources, the involvement of ICPs is a pre-requisite to meet funding requirements (Elhance 2000 in Klaphake & Scheumann 2006). Therefore, RBOs activities and studies are mostly funded by international ICPs. On the other hand, member states in the Rhine Danube river basin contribute to funding of their RBOs. Danube river basin states contribute to funding of ICPDR and little assistance from ICPs such as UNDP (Table 2). This shows differences in development between east and west Europe.

Member countries

The costs of RBO operations, especially the secretariat, are usually borne by the member states on an equal basis in southern Africa. Initially, in infant RBOs ICPs make large contributions. In SADC RBOs have equal member state contributions (after taking into account the ICP contributions). Interestingly, the Danube has three levels of member state contribution associated with different development levels. This was mutually agreed among the member states, but is temporary until each state can afford to pay the same. Countries such as German, Austria, Czech Republic, Slovakia, Hungary, Slovenia contribute 10.7% each whilst Bulgaria, Serbia, Croatia and Romania contribute 7.6% each and Ukraine, Bosnia and Moldova each contribute 1% to the ICPDR budget (ICPDR, 2007). In the MRC, Thailand pays a larger contribution (28%) than the other states (Vietnam 26% and Cambodia and Lao PDK 23% each), but the reasons are not explained.

For most RBOs member states are planning to increase their contributions. For example, the Okavango basin member states will contribute an average of 18.3% of the operation cost of the Secretariat for the first three years whilst the remainder will be funded by ICPs. However, it worth noting that the Secretariat financial plan show that member states will increase their contribution to US\$400,000 to phase out ICP assistance in ten years (OKACOM, 2007). The Mekong River Basin Commission (MRC) states increased their contribution from US\$941,359 in 2003 to US\$1,627,588 in 2007 (MRC 2003 & 2007). In 2007, ICPs contributed US\$20,022,336 to the MRC (MRC, 2007). In the Rhine (ICPR) and Danube (ICPDR) River Basins, European Union funds 2.5% towards the budget of each commission and the remainder is funded by member states.

There is little cost recovery from users through other channels than national environmental policies, which is more extensive in Europe than in southern Africa.

RBO generated revenues

Few RBOs raise their own revenues. The MRC charges for RBO services such as project monitoring and supervision and research affiliations. RBOs could also raise their own funds through the sale of electricity, water or consultancy services. An example is the *Zambezi River Basin Authority*. The ZRBA charges for the water that it delivers to electricity companies. However, there is need for regulation and procedures for direct RBO income generation to avoid negative impacts on the environment (Mostert, 2005). In Bulgarian, Danube River Basin, taxes for discharge of pollutants are collected. However, the tax system is still centralised with the local and basin authorities having no power to apply individual taxes.

Private sector

Private sector funding of RBOs is currently limited and under exploited. Private sector funding assumes the form of investments, running of RBO infrastructure projects and corporate responsibility programmes. GWP (2008) highlights the motives for growing involvement of the large international private sector through government passing on the cost and work of raising funds to the private sector and also if the private sector will bring essential know-how in some technical and economic fields. Danube River Basin is financially and technically supported by the Coca Cola Company. The Coca Cola Hellenic Bottling Company financially supports Danube activities such as the international Danube Day Celebrations and Danube Box.

4 Discussion and recommendations

The major challenge is to ensure sustainable and adequate long term financing of RBOs and transboundary water resources management in southern Africa. Lack of funding is currently not the main concern as states and ICPs are perceived to provide adequate funding at the moment. The main concerns are to increase funding from the region and states, to diversify income sources and to direct ICP funds to project activities (short and long term) and plan development (short term).

RBOs in southern Africa are relatively young, but their number is significant due to the implementation of the Shared Water Courses protocol. The EU Water Framework Directive has also stimulated European RBOs. Global and regional conventions on transboundary water management provide for the establishment of RBOs but are rather vague about their roles and funding. The process of establishing RBOs is often long, ranging from ten to fifty years to conclude and third parties, often ICPs, play an important role of facilitating and funding the process. The mandate of most RBOs is limited to advice and facilitation. Member states decide and they remain responsible for project implementation.

The SADC RBOs are mostly in phase 2, i.e. development of secretariats (mostly achieved) and river basin plans (on-going). Funding of core activities is modest (usually in the order of € 0.5-1 million) and sourced from member states and ICPs. The current ICP dependency is a concern for the long term financial sustainability of RBO and their activities. Member states are increasing their contributions, but there is need to diversify income sources. Once the RBO is fully operational, the core costs can (and must) be stabilised as shown in the case of the Rhine and Danube. This can be achieved through efficient RBO operations (salary is the largest expenditure category) and by project implementation through member states, reducing the load of RBOs. The preparation of plans and project implementation is more expensive than the annual core RBO expenditures and tend to be mostly funded by ICPs. Funding requirements depend on the number and nature of projects that the RBOs undertake. Where RBOs would get involved in infrastructure projects (e.g. Senegal) large investments are required, which need to be carried or supported by the member states and the private sector.

The basis of RBO funding in SADC is too small, and opportunities exist to broaden the funding mechanisms. The study revealed several additional funding sources: resource use and pollution charges, part of which could accrue to the RBOs, charges for services provided by the RBO, private sector funding (social responsibility and investments) and a SADC contribution to each RBO (as practiced in Europe). A small surcharge on water for larger consumers (e.g. water providers and power or irrigation projects) can generate significant revenues and can be efficiently collected.

There is no uniform cost blue print for RBO as funding requirements and sources depend on their specific conditions. Relevant factors include:

- Cost increasing: lengthy negotiations during the initiation phase; the scope of the mandate of the RBO, the number of member states and the size of the basin, scale and scope of the river basin plan; implementation of infrastructure projects through the RBO; obviously, inefficiencies in RBO operations lead to higher costs
- Cost decreasing: RBO budgetary requirements can be successfully controlled through in-kind contributions and direct member state funding of projects. Most RBOs benefit from in-kind contributions to the RBO operations. In-kind contributions are common for the costs of member state delegations and secretariat housing and support. In Europe, member state directly fund RBOs projects that directly concerns them.

Contributions to RBO funding in SADC are equally shared among member states of each RBO. The Danube has (temporarily) differential contributions based on the development level of the states. In Europe, the regional organisation provides a small amount of core funding for each RBO (2.5%). This can be seen as a form of regional support and commitment. Both examples should be considered in southern Africa.

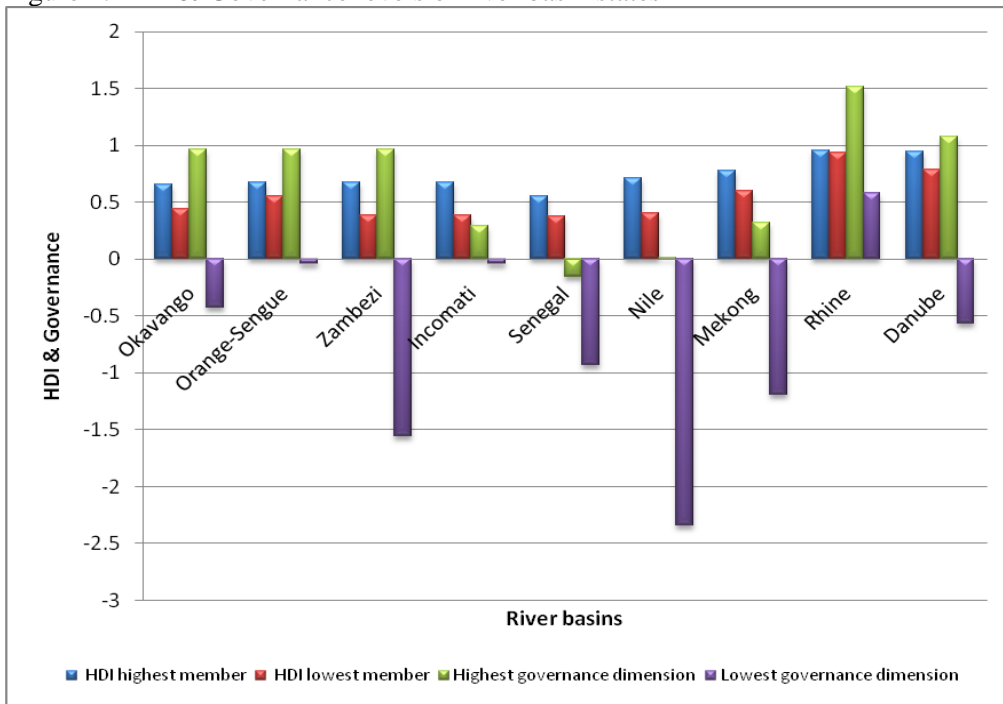
Table 1 RBO characteristics

	Okavango OKACOM	Orange ORASECOM	SENEGAL	MEKONG MRC	RHINE ICPR	Danube ICPDR
Basin details						
River length (km)	1,100	2,300	1,800	4,500	1,320	2,875
Basin area (km ²)	413,550	1,000,000	436,100	800,000	162,500	800,975
Basin population	1.1 million	19 million	3.5 million	60 million (lower Mekong)	50.3	83
Basin States	3	4	3 to 4 (Guinea left and returned)	6; 2 are not members, incl. China	4	19 (5 are not members)
Basin development level	Low	Highly developed with many dams and transfer schemes	Reasonably developed with several dams and hydropower schemes	Low	Highly developed	Highly developed
Institutions	Secretariat (2008), technical steering group and	Secretariat (2008) with 4 staff	Permanent Water Commission; advisory Committee & regional Planning Committee	Mekong River Commission	Exec. Secretariat ICPR	Exec. Secretariat ICPDR Expert groups
Mandate	MoU 1994 Mostly advisory	MoU 2000 Advisory; coordination of projects and funding; Carry out decision support feasibility studies	MoU 1963 & 1970 Advisory, policy making Promoting development development of joint infrastructure projects	MoU 1995 Advice and facilitation	MoU 1950 Operation and implementation	moU 1999 Operation and implementation
Stage	Stage 2. Working on TDA and RBMP; Heavy ICP dependency for project and plan development	Stage 2. Working on TDA and RBMP; Heavy ICP dependency for project and plan development	Stage 3; Implementation	Stage 2: Close to implementation Mekong River Development Plan complete?	Stage 3: Implementation of Rhine River management Plan	Stage 2/3: Development and implementation; Danube River management Plan due in 2009 Implementation with some ICP support

Table 2 RBO expenditures and sources of funding

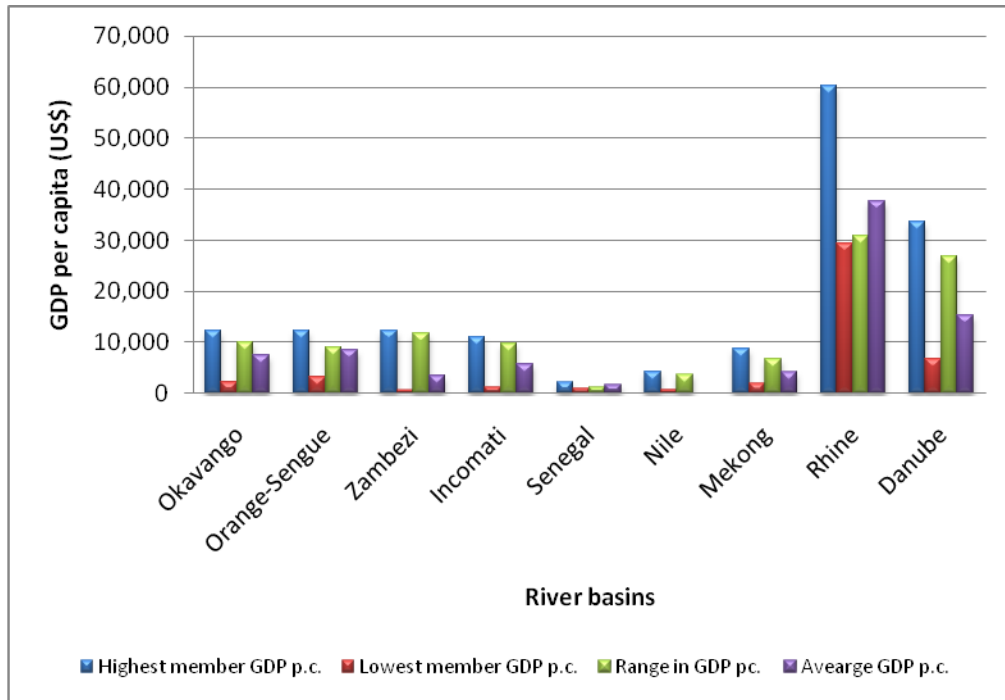
	Okavango OKACOM	Orange ORASECOM	SENEGAL	MEKONG MRC	RHINE ICPR	Danube ICPDR
Annual operating expenditures	Around US\$ 900,000 Still mostly ICP funding (80%)	Rand 2 million or around US\$ 250,000	US\$ 1.3 million. Countries pay equal amounts.	US\$ 1.5-2.5 million Mostly funded by member countries	€ 700,000	€ 900,000
Sources of funding	SIDA (US\$177,446) & USAID (78,887) start-up phase of Secretariat Member countries (currently 20% of operating costs)	French GEF, GTZ, EU & member countries equal contribution to operating costs (R2million about US\$253,000)	World Bank, AfDB, ADF, FFEM France, European Development Fund, Islamic Development Bank, German KWF, Canadian CIDA, EU	Danish, Swedish, UNDP, Japan, GTZ, ADB, New Zealand, Dutch, Belgium, OFDA,	River basin states, EU (pays 2.5% of ICPR budget), own RBO (from sale of publications), user and pollution charges	River basin states, EU (pays 2.5% of ICPR budget), GEF and Coca Cola Company
Projects	UNDP/GEF is funding development of TDA 2004-2010 (US\$5.7 million) Every river has its people project (sustainable management of river basin resources) if funded by SIDA 2004-2012. Integrated River Basin Management Project (IRBM) funded by USAID (US\$7million)	Transboundary diagnostic analysis (US\$6million) institutional strengthening in the Orange-Senqu funded by EU (2.5million €s) Integrated water resources management plan by GTZ (4million €) Six short period projects totalling € 800,000 funded by French GEF	Two dams at costs of US\$ 800 million; Hydro power project for US\$ 450 million; financed by loans & grants Developing integrated river basin management tools and improving management of water resources in Senegal basin funded by FFEM France (€ 1.5 million) Senegal River basin Multi-Purpose Water Development Project financed by the World Bank (US\$ 110 million)	Mekong highly ICP funded: Environment Management Programme funded by Danish, Swedish, Dutch & UNDP (US\$7.398million) Integrated Capacity Building Programme by Danish, Swedish, UNDP & New Zealand (US\$1.316million) Water utilisation Programme funded by UNDP & Fin (US\$15.854million) Flood Management and Mitigation programme by German, Dutch, Danish, OFDA, Asian Flood Network, ADB (US\$19.866million) Navigation Programme by Belgium (US\$6million)	Member states are responsible for funding of projects undertaken within their territories.	Analytical Quality Control project funded by voluntary contributions from some members (€ 22,000) Coca Cola Company supported ICPDR: 2005 Green Danube Partnership developed Danube Box 2006, the company supported Danube day celebrations and Danube Box education material and also technical support for the development of the Business Friends of the Danube Fund Danube Regional Project by GEF (US\$ 17.24million) & from in-kind contributions from beneficiary countries (US\$ 19.5million).
Project implementation	Developing and preparation of a TDA	Developing and preparation of a TDA	ESKOM operates hydro power project (managed by SOGEM) SOGED manages water supply	Mostly studies and advice	Operation and implementation	Operation and implementation

Figure 1: HDI & Governance levels of river basin states



Source: Kaufmann, 2009; UNDP, 2007

Figure 2: GDP per capita of river basin states



Source: UNDP 2008

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