# Management of Shared Water Resources in Southern Africa and the Role of External Assistance

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## 1. Abstract

The purpose of this paper is to identify some challenges and opportunities to the management of shared water resources in Southern Africa and the role external development assistance can play. A common denominator for all Southern African countries is that their water resources are shared, scarce and vulnerable. If the water resources of the region are not managed wisely, water could prove to be a limiting factor for sustainable growth, as well as be a source of distrust between countries. The experience from the field of development cooperation indicates that limited support to joint management initiatives, driven by the countries themselves, has a catalytic effect and assists in building confidence, trust and capacity. It is concluded that the capacity to manage water at the national level needs to be strengthened in order to succeed with international initiatives. Two case studies on the Zambezi and the Pungwe rivers, illustrate the cooperative framework that is emerging on the river basin level facilitated through the support of the Southern Africa Development Community (SADC).

## 2. Regional Setting and Challenges

Water in Southern Africa<sup>1</sup> has over time become an increasingly scarce resource which is creating competition and tensions amongst user groups and sectors on a local, national and sub-regional level. Three main factors or challenges could be singled out behind this development which, evidently, is also linked to the political and economical development in the region.

(*i*) *Climate:* The pre-dominant semi-arid climate of the region, characterized by a distinct wet and dry season coupled with a highly variable annual rainfall and high evaporation rates, limits easy access to water. The annual rainfall variability results in severe droughts and occasional floods. During the last decade, the region has experienced two longer periods of drought with a widespread impact on the economies and increased poverty as a result. Recently, devastating floods struck the Eastern part of the region and countries with already fragile economies, such as Mozambique and Zimbabwe, suffered in terms of loss of lives, property and productivity. The region's natural climate variability makes management of available water resources a serious challenge that could be even greater with the impact of human induced climatic changes.

Management of Shared Water Resources in Southern Africa and the Role of External Assistance

<sup>&</sup>lt;sup>1</sup> For the purpose of this paper Southern Africa is defined as the mainland countries making up the Southern Africa Development Community (SADC). The treaty establishing SADC was signed in Windhoek, Namibia, 1992 and builds on the former SADCC that was established in Lusaka in 1980. Member states are: Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Each member State has a responsibility to coordinate a sector or several sectors on behalf of the others member states. SADC's goal is to achieve an integrated regional economy on the basis of balance, equity and mutual benefit.

(*ii*) Population growth: With increased population numbers, demand for water for domestic consumption, agriculture and industrial production will grow. Today, approximately 193 million people live in the SADC region and, according to the United Nations Medium Projection, the population is expected to double by 2025. At the same time, 70 % of the people are expected to live in urban areas and the urban population in many countries is expected to triple (GWP-SATAC, 2000). Using the water stress concept (Falkenmark and Lindh, 1993), a majority of the SADC countries will experience water shortages during the dry season and three countries will be below the benchmark level of 1000 cubic meters per person per year (Granit and Johansson, 1995). Competition between sectors such as agriculture, that in average consume 70% of the available water, industry and water for maintaining eco-systems will increase.

(*iii*) Management: Management of water resources is generally weak across the region due to a fragmented and weak institutional and legal framework. This often leads to poor planning and utilization of the use of available resources, e.g. favoring supply management to demand management, the price for water not reflecting its true value and water rights not being issued or administered in a transparent manner. The uncertainty of water rights leads, in many cases, to mistrust between users and low levels of investments in water demanding ventures. Guaranteed access to water in agriculture based economies with dry climates is as important as the ownership of land. The present water rights often reflects the colonial heritage favoring established minority farming societies. Groundwater and surface water is generally privately owned which makes allocation of it to priority sectors difficult during periods of shortages. Modern water law, as currently being introduced in South Africa, puts the ownership of water into the public domain and uses the concept of water permits issued for limited time periods. This can allow for flexibility and the possibility of allocating water to different sectors in a transparent manner, addressing the generally skewed access to water by different groups in the society.

Management is further complicated by the fact that the water resources of Southern Africa are shared. The drainage areas of the 15 major river basins cover as much as 70 percent of the region's land surface. River Zambezi, the major river in the region, is shared by eight riparian countries and Mozambique is the downstream riparian of 9 shared rivers (table 1). The shared river basins play a significant role for the development of the region and are utilized for example for hydropower, irrigation, fishery, tourism and other productive uses. With increased population growth and development the riparian countries will seek to utilize what they regard as their rightful claims. Looking at the medium-term development plans of most countries the water resources of the international basins will unlikely be able to fulfill the sum of all demands claimed by the states. Joint management of these basins is therefore a prerequisite for achieving sustainable development. This, however, demands partners that are able to cooperate and negotiate on an equal level. Without this capacity and knowledge, the weaker riparian, especially if downstream, will be concerned with threats to its development agenda and ultimately its sovereignty.

Table 1. Overview of basins shared by continental SADC member countries (based on Chenje and Johnsson, 1996 and Pallet, 1997)

Country	Number	Basins shared with other SADC countries
	of basins	5
Angola	5	Congo, Cunene, Cuvelai, Okavango, Zambezi
Botswana	4	Limpopo, Okavango, Orange, Zambezi
DR Congo	2	Congo, Nile
Lesotho	1	Orange
Malawi	1	Zambezi
Mozambique	9	Buzi, Incomati, Limpopo, Maputo, Pungwe,
		Ruvuma, Save, Umbeluzi, Zambezi
Namibia	5	Cunene, Cuvelai, Okavango, Orange, Zambezi
South Africa	5	Incomati, Limpopo, Maputo, Orange, Umbeluzi
Swaziland	3	Incomati, Maputo, Umbeluzi
Tanzania	3	Congo, Ruvuma, Zambezi
Zambia	2	Congo, Zambezi
Zimbabwe	6	Buzi, Limpopo, Okavango, Pungwe, Save,
		Zambezi

*Politic-economic factors:* Successful management of water on both a national and regional level could, in addition, not be viewed separately from other driving politic-economic factors in the region. Regional economic growth rates are at 1-2% per annum and the majority of the population is on average living on less that 1 US\$ per day (GWP-SATAC, 2000). According to the World Bank, growth rates around 5 % are required to reduce poverty in order to cope with the population growth (World Bank, 2000). The HIV/AIDS pandemic will also have severe economic impacts since it hits the productive segments of the population.

# **3. The Consultative Process: Towards a Southern African Water Resources Management Consensus**

*International fora:* The fact that water is increasingly becoming a limiting factor for economic and social development in general, and that access to reliable sources of fresh water through effective management on a national and international level is key to development has been recognized in several recent international fora. Such major events, particularly addressing the Southern African situation, have been the Second World Water Forum were the Southern Africa Vision for Water Life and the Environment in the 21<sup>st</sup> Century was presented (March 2000), the SADC/UNDP Water Sector Round Table Conference (December 1998) and the SADC/ EU Conference on the Management of Shared River Basins (May 1997). The regional input to these international fora has been prepared in a consultative manner using the framework of the Southern Africa Development Community (SADC) involving representatives from Governments and, to a more limited extent, civil society and the private sector.

Management recommendations: Recommendations emerging on best practices for Integrated Water Resources Management (IWRM) from these and other fora propose that: river basins should be regarded as management units (in a local, nation and sub-regional perspective); that land use management should be linked to water resources management using an ecosystem approach; demand management practices should be promoted including recognizing water as an economic good; and, management should be at the lowest appropriate level using participatory approaches taking into account gender aspects.

The SADC framework: The SADC framework provides a good vehicle for engaging government representatives throughout the region. SADC has been active in promoting regional cooperation on shared water courses. In 1995, it established a separate water sector and sector coordination unit (SADC-WSCU), based in Lesotho, to work towards the goal of sustainable development, equitable sharing and conservation of water resources. The water sector consists of the following organs: the Committee of Water Ministers, the Committee of Water Senior Officials, the Sector Coordination Unit (SADC-WSCU), the Water Resources Technical Committee and sub-Committees and Water Course Institutions established by riparian countries.

The SADC Protocol on Shared Water Course Systems: A key legal instrument for achieving the development goal of the sector is the Protocol on Shared Watercourse Systems that was signed in 1995 by the member countries. To date nine out of twelve countries have ratified the protocol and it is therefore in force. The Democratic Republic of Congo and the Seychelles, being new members of SADC, have not yet signed the protocol. The protocol has recently been amended to incorporate some of the key issues in the 1997 "UN Convention on the Law of Non-Navigational Uses of International Water Courses". The objective of the Protocol is to foster closer cooperation for sustainable management, protection and utilization of the water resources of shared water courses and to advance the SADC agenda of regional integration and poverty alleviation.

Some important general principles in the protocol state that; watercourse states shall utilize a shared water course in an equitable and reasonable manner; state parties shall harmonize their water uses; the utilization of shared water courses shall be open to each watercourse state, member states shall maintain a proper balance between resource development and conservation of the environment; state parties shall exchange available hydro-meteorological information and data; state parties shall exchange information and consult each other of planned measures on the condition of a shared watercourse; state parties shall take appropriate measures to prevent or mitigate conditions that may be harmful to other watercourse states; and, state parties shall establish joint management mechanisms.

SADC Regional Strategic Action Plan: Following an intensive regional consultative process the SADC water sector approved, in September 1998, a Regional Strategic Action Plan for Integrated Water Resources Development and Management 1999-2004 (RSAP). The RSAP, including a list of 31 sub-regional project concept notes, was presented at the first SADC/UNDP Round Table consultative forum in December 1998. The strategy is comprehensive and serves as a guidance for SADC towards better management of its shared water resources. Some of the sub-regional project concept notes, incorporating best practices in IWRM, are currently being developed by the SADC-WSCU in partnership with other institutions in the region.

*Civil society:* Southern Africa has several well established regional Non-Governmental Organizations such as the International Union for the Conservation of Nature (IUCN), The Global Water Partnership Southern Africa Technical Advisory Committee (GWP-SATAC) and the Southern Africa Research and Development Center (SARDC) to mention a few. These NGOs and numerous civil organizations on a local level are implementing innovative IWRM pilot projects and capacity building initiatives throughout Southern Africa. Several NGOs have been extensively involved in the above mentioned consultations often in partnership with the region's academic research institutions and the private sector.

*Partnerships:* It is eminent that a fruitful partnership has begun to emerge on the regional level between Governments represented by the SADC Water Sector, academic institutions and regional NGOs. This partnership has created a regional consensus and a good general understanding, amongst senior policymakers and those parts of the civil society engaged in development issues, of the challenges ahead especially in terms of the necessity to build capacity and reform the institutional and legislative frameworks.

### 4. Case Studies

Two cases, below, on the Zambezi and the Pungwe rivers illustrates some emerging trends of cooperation that take place on the river basin level in SADC.

### Case I: The Zambezi Basin (Based on SADC, 1996; SADC, 1999 and Denconsult, 1998)

*The river basin:* The Zambezi River, together with its tributaries, forms the fourth largest river basin in Africa. The river flows 2700 km from its sources on the Central African Plateau to the Indian Ocean. The basin covers an area of about 1 360 000 km<sup>2</sup> and includes territories in eight SADC countries (Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia and Zimbabwe). A few countries have large parts of their territory within the basins, such as Malawi 93%, Zambia 72% and Zimbabwe 64%. From its origin in Zambia the river flows into Angola, it then enters Zambia and passes through the Eastern Caprivi Strip. It reaches Victoria Falls at the border of Zambia and Zimbabwe were it further down stream fills up the reservoirs of Lake Kariba, shared jointly by Zambia and Zimbabwe, and Cahora Bassa in Mozambique. About 150 km before the river reaches the Indian ocean it is joined by the Shire River that connects the Zambezi with Lake Malawi and its catchment that reaches into Tanzania.

The average annual rainfall for the whole river basin amounts to approx. 970 mm and the average annual potential evaporation is 1560 mm. The climate is characterized as tropical-montane with three distinct seasons: April to August cool and dry, September to October warm and dry and November to March warm and wet. The total population in the basin is estimated to be 38.4 million people, mainly concentrated in the states of Zambia, Zimbabwe and Malawi. The present density of the population is 28 per km<sup>2</sup>. If present growth-rates of population are sustained the population will double its number within the next generation. About 70% of the economic active population is working in the agriculture sector. The most important industries in the basin are mining of relatively few ores, predominantly copper and hydropower.

*Framework for cooperation on an international and national level:* All eight Zambezi basin countries are members of SADC and have signed the Protocol on Shared Watercourse Systems in the SADC region. On a national level several of the Zambezi basin countries are involved in a process of water policy sector reform including up dating the national water legislation. Zimbabwe and Mozambique have already introduced new water legislation and are in the process of implementing it. Namibia is in an advanced stage of reviewing its water policy. Angola, Malawi, Zambia and Tanzania are initiating sector reforms. The new water policies have in common that they emphasise decentralised management of the water resources on a catchment basis. Water will be regarded as an economic good and stakeholder participation is stressed in all management aspects.

Joint initiative: The Zambezi River Action Plan (ZACPLAN) was initiated already in 1987 through the support of UNDP. ZACPLAN consisted originally of 19 sub-projects. The development of the SADC Water Protocol was originally designed for the Zambezi basin but it was decided by SADC to expand it to encompass all SADC countries. Sida, Norad and Danida began to support the ZACPLAN process in 1990 through technical assistance to SADC's Land Management Sector (ELMS), then responsible for coordination of ZACPLAN. This support resulted in, amongst other things, the establishment of a hydro-meteorological database for the basin. The increasing demands on SADC-ELMS, in relation to shared water resources management, led SADC to establish a new water sector in 1995 that took over the ZACPLAN process. During this period of change, confusion regarding ownership of the process delayed project preparation.

In 1994 SADC-ELMS prepared an amalgamated project proposal called ZACPRO 6, phase II. The proposal was assessed by the Nordic donors the same year. The proposal, however, did not focus

on the establishment of the joint institutional framework necessary for such a project to be successful. The newly established SADC water sector prepared an Issues paper in 1997 to highlight and communicate to the riparians key issues in relation to the preparation of the project. As a result of this, the SADC water sector initiated several project preparation activities, including the signing of an Memorandum of Understanding with the Zambezi River Authority to host the project's secretariat and commissioned the drafting of an Agreement for a Zambezi Basin River Basin Commission (ZAMCOM).

Scope of ZACPRO 6, Phase II: The revised project proposal emphasises a process approach and the development of a strategy rather that a plan for the basin. The development objective of the project is "improved water availability and protection against floods, droughts and pollution in Zambezi River Basin". The immediate objectives focus on necessary tools to reach the development objective such as the establishment of an enabling environment including ZAMCOM, capacity building and development of water resources management system and models. The project is about to be launched with the support of the three Nordic donors.

*Key issues:* The preparation of a sub-regional shared water resources project such as ZACPLAN is complex. It takes long time to reach consensus especially when a participatory process is chosen involving civil society in addition to the riparian Governments. Furthermore, this is a costly process involving significant technical and financial support.

Complex basin wide planning should preferably be process oriented and not strictly output oriented. The focus of ZACPRO 6 is on the development of strategies and broad frameworks rather than on a static plan. This allows for countries to participate and benefit on different levels without threatening their sovereignty.

High level political commitment is central. The ZACPLAN process has suffered from not being able to establish ZAMCOM to guide the process on the basin level. The establishment of ZAMCOM is one of the core outputs in ZACPRO 6, phase II.

A strong and credible institution in the basin should be appointed by the riparians to manage the detailed preparation and subsequent implementation early on in the process. The riparian countries selected the Zambezi River Authority (ZRA) to host the secretariat for the project.

The engagement of civil society, in preparation and implementation of sub-regional projects is crucial. ZACPLAN is implemented and known only amongst a limited group of key Ministries.

Donor coordination on a sub-regional level is necessary. It will not occur unless there is agreement amongst the key donors that one donor leads and that this donor invest necessary time and budget to move the process forward. A regional presence helps in this regard.

Case II: The Pungwe Basin (Based on DNA and DWD, 1999 and Nilsson and Shela, 1998)

*The river basin*: The Pungwe Basin originates in the eastern highlands of Zimbabwe and flows eastwards through the coastal plain of Mozambique and reaches the Indian Ocean at the City of Beira. The basin has a total area of about 31,000 km<sup>2</sup>, of which 95% is located in Mozambique and only 5% in Zimbabwe. Due to usually good rainfall in the upper part of the basin the contribution of water from the Zimbabwean side is relatively high. The river is not regulated and the seasonal flow thus varies significantly. The minimum flow can go below 4 m<sup>3</sup>/s, while maximum peak flows can be as high as 3,000 m<sup>3</sup>/s at the mouth of the river. Low flows cause intrusion of salt water as far as 80 km inland and high flows cause massive flooding in the lower part of the basin.

In Zimbabwe's part of the basin a significant development is the water supply to the City of Mutare. The water supply scheme involves the out of basin transfer to the city using gravity. During

the preparation phase of the project, negotiations took place with Mozambique to agree on a right to abstract water. Other important water dependent activities in this part of the basin include irrigation at commercial tea plantations, small-scale farming in communal lands and tourism. In Mozambique major development interests are located in the lower part of the basin in the form of water supply to the city of Beira and irrigation on large sugar cane estates. The middle part of the basin is sparsely populated since many areas were abandoned during the civil war. There is a largely untapped potential for irrigation in those parts of the basin.

*Framework for co-operation on an international and national level*: Both countries are members of SADC and signed in 1995 the Protocol on Shared Watercourse Systems in the SADC region. The recently successfully completed negotiations on the amendments to the Protocol have set the stage for the signing of the "Agreement on the Establishment and Procedures of a Joint Water Commission Concerning Water Resources of Common Interest". The absence of the Commission made planning on joint management initiatives difficult. The Agreement on the Commission sets the framework for joint studies and development strategies of several shared rivers between Mozambique and Zimbabwe. The planned functions of the Commission are to analyse available shared water resources, advise on reasonable demands from common water resources, and exchange data and adopt criteria on the conservation, allocation and sustainable utilisation of common water resources.

Mozambique is currently implementing a National Water Development Project supported by the World Bank in cooperation with other bilateral donors. The primary objectives of this project, in relation to the management of the Pungwe river, are to promote implementation of decentralized river basin management, reinforce Mozambique's capacity to obtain and fulfil agreements on shared water resources with other riparian states and enhance international river basin co-operation. In Zimbabwe, water resources management is also in the process of being decentralized as part of the implementation of a new water resources management policy and water law.

Joint initiative: Mozambique and Zimbabwe initiated discussions on a joint study on the Pungwe river already in 1994. In October 1999 the two countries agreed to a joint study which development objective is "to achieve a sustainable, equitable and participatory management of the water resources of the Pungwe Basin, and increase the derived social and economic benefits for the people living in the basin, and other stakeholders". The main output of the study is the development of a joint integrated water resources management strategy. The development of the strategy entails a process oriented approach, including participatory and consensus building decision making, to ensure involvement of stakeholders. Capacity building is at the core of the project to ensure sustainability and continuity in the development and implementation of the strategy.

*Key issues:* There are few examples of functioning shared river basin initiatives in Southern Africa. The Pungwe study, only involving two riparian countries, cover most issues at stake in connection with shared water resources management. These include: opportunities for flow regulations to develop water availability for different sectors in the society, possibilities to reduce the risk of destructive floods, competing demands for scare water resources, implementation of International and sub-regional Agreements and language and culture barriers.

The joint study is focusing on the development of common strategies to try to identify win-win scenarios in the basin. It is targeting capacity building and is designed so that it offers opportunities for both countries during implementation.

Ownership to the process has been crucial throughout the preparation process. The study will be guided by the Joint Commission when it is in place. In the interim, a bilateral steering committee consisting of Senior Officials will guide the study.

The presence of a neutral third party, present in both countries with access to local stakeholders as well as Government representatives, has facilitated the preparation process towards study implementation. This has involved financing of seminars and consultancies.

### 5. Conclusions

Southern Africa has articulated a vision of sustainable economic growth and poverty alleviation to be achieved through regional integration and cooperation. The proper management of the region's water resources could be a major driving force to fulfill this vision through the creation of cooperative frameworks and win-win scenarios. The political commitment by Water Sector Ministries to address management of water resources on a national level through policy and legislative reforms and on the sub-regional level through the implementation of the SADC Water protocol is evident. On the regional level the SADC framework creates a good foundation for joint collaboration, awareness raising and trust. Some key issues to address in the preparation of shared water resources management initiatives in Southern Africa are:

Political commitment to a multi-sectoral approach: The slow pace of implementing integrated management of water resources on the sub-regional level, in spite of the high-level commitment expressed in the SADC protocol, is partly due to limited cross sectoral and financial commitment on the national level. International and national fora stress the integrative nature of water resources management but so far key sector Ministries such as Foreign Affairs and Finance are only involved to a limited extent. A stronger engagement of diplomatic instruments and channels in addition to the Ministries of Water would be instrumental to facilitate planning and implementation of projects with regional dimensions. Taking into account one of the key principles of integrated water resources management, i.e. using the river basin as the management unit, riparian country driven mechanisms to achieve coordination should be established and preferably led by Ministries of Finance and Planning in partnership with Ministries responsible for Water Affairs. This would secure input from all concerned sectors in the society.

*Capacity building:* It is crucial to include capacity building components on a national level in the context of shared river basin initiatives. Cooperation on the sub-regional basin level will not be successful if some parties are very weak and some are strong. Support on both a national and sub-regional level should occur simultaneously.

*Public awareness and participation:* It is important to broaden the knowledge and participation amongst key decision-makers outside the water sector and the general public of the ongoing basin wide initiatives. National Governments are responsible for information dissemination but have in practice, generally, been quite inactive. The experiences of engaging and supporting professional regional NGOs in information dissemination as well as in project preparation and implementation is promising.

Broadening the finance base: The wide range of actions necessary to manage river basins will require resources to be raised from a large number of different sources from within and outside the basin. There is a tendency in the region to restrict external financial and technical support to only a few key donors. In order to mobilize necessary long term financial support, co-financing arrangements with several donors in partnerships will be important. Such partnerships should involve key Ministries from the riparian states, multilateral and bilateral donors, NGOs and the private sector were applicable.

Long term commitment: From a donor's perspective support to integrated water resources management on a regional basis is time-consuming and staff intensive. The level of engagement in the preparation of sub-regional projects is high but necessary considering the large number of involved parties and the associated regional political dimension. The rationale for the long-term

commitment is that the support is process oriented rather that strictly output oriented and is designed to build trust and confidence between countries sharing a watercourse. The establishment of multi-national, political and technical cooperation frameworks take time but should deliver result in the form of improved neighborliness, economic growth and the creation of enabling environments for joint investments.

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