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	Institutional Structures in the four Orange Basin States
	Legislation and Legal Issues Surrounding the Orange River Catchment
	Summary Report

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

1 INTRODUCTION AND BACKGROUND

1.1 General

The Orange-Senqu River originates in the Lesotho Highlands and flows westward for 2200km, to the Atlantic coast of South Africa and Namibia, forming the border between those two states. The Basin also encompasses the southern portion of Botswana. As such, there are four basin states that share the waters of the Orange-Senqu River Basin (**Figure 1.1**).

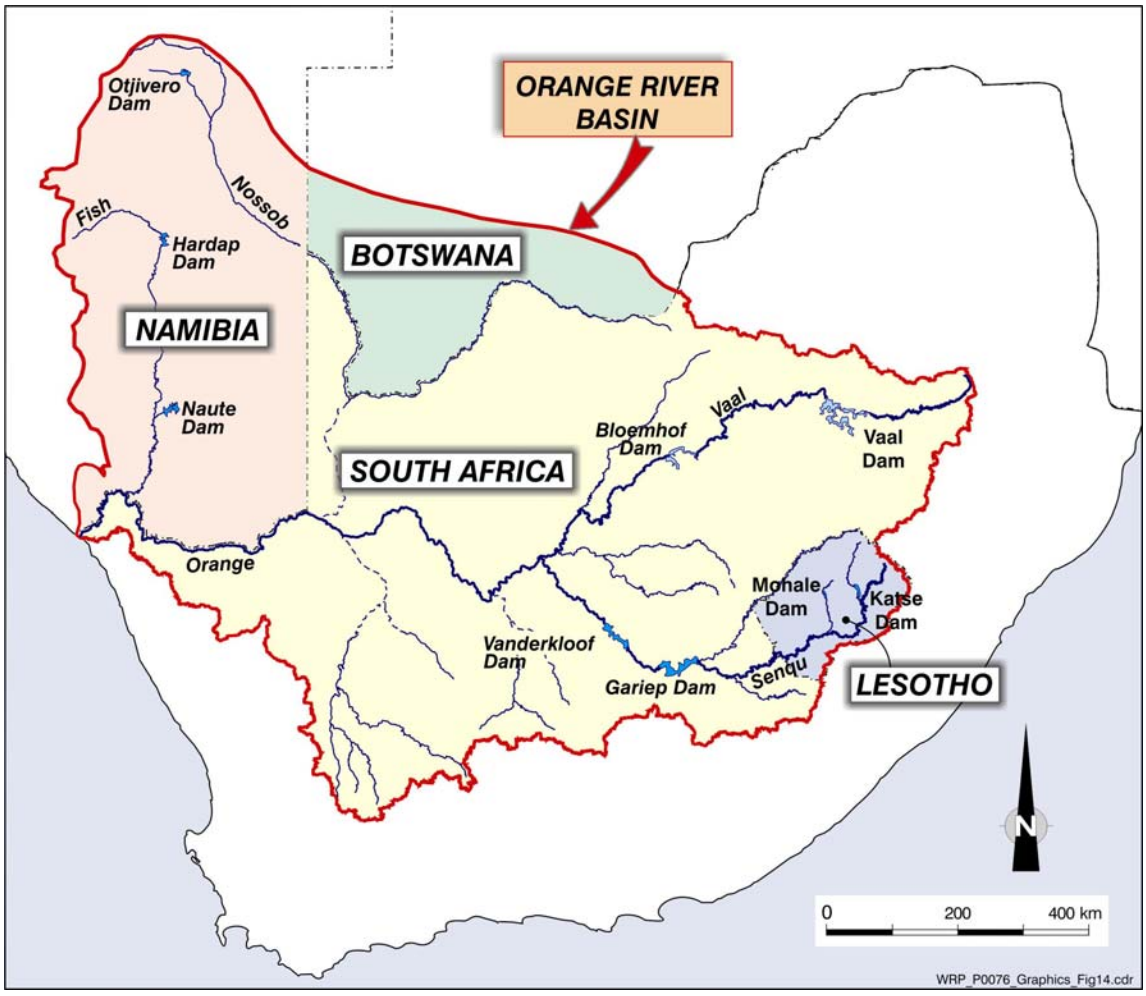


Figure 1-1: Orange River Basin

The basin covers almost 1 million km^2 and has an estimated natural runoff of 11,300km^3 per anum[1], though this can vary between 40,000km^3 and zero. With an average mean annual precipitation of 400mm per anum, the basin is considered arid by world standards[2]. The contributions of the four states to the basin, and the area of the basin falling within each state, vary considerably as shown in **Table 1-1**.

Table 1-1: Contributions to the Orange-Senqu Basin by country [3]

Item	Lesotho	South Africa	Botswana	Namibia
Basin Area (%)	5%	60%	12%	25%
MAR (%)	41	55	0	4

Lesotho is by far the most significant in terms of its contribution, especially related to the area of the basin that falls within its territory. South Africa, with the largest area of the basin within its territory, also makes a significant contribution to the runoff.

1.2 Legislative and institutional background

The institutional and legal frameworks also vary considerably between the four basin states; however, there is one factor consistent to all: state political and legislative frameworks are considered to be in a transition period in all countries. The 1994 political transition in South Africa has led to an entirely new Water Act and a change in the delivery and management of water services (following local government restructuring). Botswana's institutional framework is based on its 1991 Water Master Plan[4], which is currently under review. Both Lesotho and Namibia are in the process of water sector improvements.

[1] 2004. Senqor Consortium. *Integrated Water Resources Management Plan for the Orange-Senqu Basin: Inception Report*.

[2] 2004. Heyns. *Achievements of the Orange-Senqu River Commission in Integrated Transboundary Water Resource Management.*

[3] 2005. Krantz *et al*. *Governance, Institutions and Participation in the Orange-Senqu Basin*.

[4] 1991. Botswana DWAF. *National Water Master Plan*.

All four states are signatories to the SADC Revised Protocol on Shared Watercourse Systems (2000), which was initially adopted in 1995 and then revised in 2000, in order that its provisions were brought in line with those of the United Nations Convention on the law of the non-navigational uses of international watercourses (1998). The Protocol makes provision for management institutions for shared watercourses, and sets out five components that limit use of international watercourses. They are as follows:

- Balancing development with conservation
- Inter-state co-operation
- Equitable sharing of water resources
- Developing compatible national systems
- Notification of emergencies

While the practical applicability of its provisions regarding the allocation of international waters remains in question, the Protocol provides the guiding principles for equitable and sustainable allocation of international waters in the SADC region. As such, and because all four basin states are signatories to the Protocol which is now in force, it is the overarching framework for the management of international waters in the Orange-Senqu basin. This framework should provide the basis for "a harmonized legal regime for the Orange River in which the revised SADC Protocol, the ORASECOM agreement and the national legislative arrangements for the four countries fit logically together".[5]

Each basin state has its own legal, policy and institutional framework governing the use of both national and international waters, adding significant layers of complexity to water management at basin level. Furthermore, the four states vary considerably in both economic power and levels of development, often with highly divergent needs in terms of the use of the waters of the Orange-Senqu basin. It is therefore essential that the existing institutional framework be mapped nationally and internationally in order that the levels of complexity can be clearly understood.

It is important to understand the historical context in which these institutions were devised and developed. The major development projects were conceived at a time when public

[5] 2006. Senqor Consortium. *Integrated Water Resources Management Plan for the Orange-Senqu Basin: Legislation and Legal Issues*

participation, and environmental investigation were not carried out routinely for large development projects. Moreover, the political context was heavily influenced by the South African apartheid government, and was subject to the controversies and issues generated by that context. As a result, the older institutions established in the Orange-Senqu basin reflect the context in which they were formed. This has generated significant controversy with (often vociferous) criticism from international NGOs, environmental and social activists and the media. The current institutional framework should be examined in this context in order to be able to inform the development of an institutional framework that is robust enough to address these issues, and flexible enough to incorporate the lessons learned, both from the past, and through the development of a new integrated institutional structure.

1.3 Approach and Methodology

1.3.1 Approach

An institutional scan was conducted which identified the relevant institutions at the various scales within the four ORASECOM partner countries. The inter-relationships between these institutions were then mapped to provide an indication of the institutional landscape in which ORASECOM operates. Significant infrastructure projects in the basin, which have an impact on the current institutional structures, were also examined. These structures were then evaluated in the context of current thinking in international river basin management (IRBM) institutional structures.

Extensive studies of IRBM structures across the globe in the last two decades have revealed a number of lessons to be learned in building effective institutional structures for international basins. It is these lessons that have formed the background principles for international instruments such as the SADC Protocol. The Orange-Senqu institutional structure was evaluated in the context of these criteria.

1.3.2 Methodology

A review of documentation was conducted of institutional arrangements, policy and legislation in each of the four basin states, in order to map the existing institutional situation and document any currently ongoing and future changes. Institutional framework diagrams were produced for each basin state and for the basin as an international entity.

Following the evaluation in the context of current IRBM research, the institutional map was redrawn to reflect the necessary adjustments to the structure in order to address the

issues highlighted by current IRBM research, and to align the institutional structure with the international legislative framework for transboundary water management in the region.

2 THE BASIN STATES

2.1 General comparison of basin states

The following table (**Table 2-1**) gives a comparative overview of the general facts of each of the basin states.

Table 2-1 Basin state statistics (CIA World Fact Book, IWRMP Demographics report)

Item	Lesotho	South Africa	Botswana	Namibia
Co-ordinates	29 30 S, 28 30 E	29 00 S, 24 00 E	22 00 S, 24 00 E	22 00 S, 17 00 E
Population	2 million (2006)	44.2 million (2006)	1.6 million (2006)	2 million (2006)
Population growth rate	- 0.46% (2006 est.)	- 0.4% (2006 est.)	- 0.4% (2006 est.)	0.59% (2006 est.)
% Population resident in basin	100%	29.8%	2.8%	8.9%
% of total basin population	13.5%	84.9%	0.3%	1.3%
Total Area	30,355km^2	1,221,038 km^2	581,730 km^2	824,292 km^2
Climate	Temperate; cool to cold, dry winters; hot, wet summers	Mostly semiarid; subtropical along East Coast	Semiarid; warm winters and hot summers	Desert; hot, dry; rainfall sparse and erratic
Terrain	Mostly highland with plateaus, hills, and mountains	Vast interior plateau rimmed by rugged hills and narrow coastal plain	Predominantly flat to gently rolling tableland; Kalahari Desert in southwest	Mostly high plateau. Namib Desert along coast. Kalahari Desert in east
GDP	US$ 1.362 billion (2005)	US$ 187.3 billion (2005)	US$ 9.046 billion (2005)	US$ 4.976 billion (2005)
GDP Growth	0.8% (2005)	4.9% (2005)	4.5% (2005)	3.5% (2005)
GDP per capita	US$ 2,500 (2005 est.)	US$ 12,000 (2005 est.)	US$ 10,500 (2005 est.)	US$ 7,000 (2005 est.)
Government type	Parliamentary constitutional monarchy	Republic - constitutional democracy	Parliamentary Republic	Republic
Position on HDI* out of 177 countries	145 (2004)	119 (2004)	128 (2004)	126 (2004)

* HDI = UN Human Development Index

South Africa has by far the highest total GDP, though it is comparable with Botswana on a per capita basis. Lesotho has the lowest GDP and together with garments, the export of water forms the majority of its export revenue. Namibia is the most arid of the four basin states, and is also the furthest downstream, however it only has a small percentage population living in the basin. The dominant nation in the basin, in terms of resident population, basin area coverage and economic power, is South Africa[6].

All basin states are considered developing countries, ranging from 119 to 145 (out of 177) on the UN Human Development Index. All except Namibia have marginally negative population growth rates, mostly thought to be as a result the prevalence of AIDS. Namibia's population growth rate is only marginally positive, indicating that future demand will be driven primarily by factors other than demographics.

Negotiations over the waters of the Orange-Senqu Basin have been ongoing between various combinations of the basin states since the 1980's resulting in a variety of bilateral and multilateral arrangements, as indicated in the next section.

[6] Additional information on the demographics and economic development of the Basin is contained in the Task 10 Report of this series.

3 INSTITUTIONAL AND DEVELOPMENT HISTORY

3.1 Institutional history

3.1.1 The Permanent Water Commission (PWC)

The PWC evolved from the Joint Technical Committee formed between Namibia and South Africa in 1987 (while Namibia was still under South African rule). The commission advises the governments of the two basin states on the use and development of the lower Orange River. The commission focuses on the Vioolsdrift and Noordoewer Irrigation Schemes (the PWC evolved from the Vioolsdrift / Noordoewer Joint Irrigation Scheme). In 1992, a bilateral agreement between Namibia (which gained independence in 1990) and South Africa established the PWC.

The PWC commenced a study in 2001 to assess the potential for efficient use of the available water resources of the lower Orange. The study includes the assessment of the potential for the construction of a dam on the lower Orange, in order to improve water management for the next 50 years[7].

3.1.2 The Lesotho Highlands Water Commission (LHWC)

The Lesotho Highlands Water Commission is a bi-national body that evolved from the Joint Permanent Technical Commission established under the terms of the Lesotho Highlands Water Treaty. This organisation is responsible for matters of joint concern to Lesotho and South Africa with regard to the implementation of the Lesotho Highlands Water Project (LHWP). Activities include the appointment of auditors and consultants, operating and maintenance plans, tendering procedures, the allocation of costs between the parties and the quantities of water to be delivered[8].

There are two national institutions linked with the LHWC. The Trans-Caledon Tunnel Authority (TCTA) manages and maintains the delivery tunnel which transfers water across the border (i.e. under the Caledon River) to the Ash River in the Vaal catchment as well as all other aspects of the infrastructure in South Africa[3]. The Lesotho Highlands

[7] 2004. Schuermans et al. *Evaluation of success and failure in International Water Management: Orange River Basin, South Africa*.

[8] 2001. Mohammed-Katerere. *Review of the legal and policy framework for TBNRM initiatives in Southern Africa.*

Development Authority is responsible for the management of all aspects of the project that fall within Lesotho, including infrastructure and social aspects, such as the resettlement and compensation of displaced communities, water supply to resettled communities, irrigation and tourism.

It is important to note that there are comprehensive and specific management provisions for the LHDA in the Treaty, while the functions of the TCTA, which are similar to those of the LHDA, "are provided for in considerably less detail and no attention is given to downstream responsibilities"[8]. This is an indication of the significant power inequalities between the two states, and also raises the issue of the exclusion of Namibia and Botswana from the Treaty despite the fact that the LHWP has a very significant impact on the waters of the Orange-Senqu Basin[5].

3.2 Development history

3.2.1 The Orange River Development Project (ORDP)[9]

The ORDP has its roots in the 1920s, when proposals were put forward to the South African government to use the waters of the Orange River in various irrigation projects. These were considered prohibitively costly, until the 1950s, following the National Party electoral victories through the late 1940s and early 1950s. The subsequent capital outflow from South Africa, as a result of the Government's apartheid policies, prompted the formulation of a comprehensive development plan for the Orange as strategy to attract investment. The plan, which was hastily compiled in the early 1960s by the then Department of Water Affairs, was formulated under considerable political influence.

Its objectives were as follows:

- To provide irrigation for agriculture
- Municipal water supply provision
- Hydro-electric power generation
- Flood prevention
- Creation of recreational facilities
- Population settlement in the basin (mainly white farmers)
- Employment opportunities

[9] 2000. World Commission on Dams. *Case Study – Orange River Development Project*

- Regional economic stimulation through water and agriculture-based industry

Because of the haste in which the planning was conducted, many of the required studies were superficial and public participation was highly limited (which was in line with Government policy at the time), and only whites in the area were notified and compensated for the negative impacts of the project.

Although significant design changes were also required as a result of the rapidity of the planning stages, as well as the complexity of the project, the Gariep and Vanderkloof Dams were constructed in the 1960s. Once again, as a result of fast-tracked planning, the additional Welbedacht Dam silted up soon after its construction (although this increased the yield of the Gariep Dam downstream). Despite the shortcomings, the project resulted in a significant increase in agricultural productivity in the area, exceeded expectations for hydropower generation, and generally met flood control expectations.

As South African policies began to change in the early 1970s, with the Commission of Enquiry into Water Matters, through to the political transformation in 1994, participation in decision-making and environmental issues began to be considered, and it understood that a reappraisal of the ORDP was becoming increasingly necessary.

This reappraisal was undertaken in the form of the Orange River Replanning Study (ORRS) between 1992 and 1998. At the same time, the National Water Act was promulgated, based on the National Water White paper drafted after the 1994 transition to democracy. Thus the principles under the new policy framework were incorporated into the new study. The result was a greater degree of participation, deeper analysis of environmental and financial impacts, the incorporation of In-stream Flow Requirements (IFR) for the Orange River, and consideration of the basin-wide implications for improved coordination with the LHWP. The guidelines and regulations necessary for effective integration of these issues in the implementation of the ORRS have, however, not yet been promulgated, indicating a gap between planning and the necessary legal and institutional reforms[10].

[10] Legal aspects of the Basin management are discussed in detail in the Task 13 report of this series.

This situation lends a sense of urgency to the formulation and implementation of the IWRMP, since it could address many of these issues, at both local and international level, through a legislative and institutional framework that will address these concerns.

3.2.2 The Lesotho Highlands Water Project (LHWP)

The Lesotho Highlands Water Project, was the largest infrastructure project in Africa, and was first conceived in the 1950s, when it became clear that the demand for water from the industrial and economic heartland of South Africa's Gauteng region would escalate beyond the area's water availability. The Project provides for water transfers from Lesotho to South Africa, and hydroelectric power generation in Lesotho. Negotiations over a period of about 30 years took place during the apartheid era in South Africa before the Lesotho Highlands Water Treaty was signed in 1986, between South Africa and the then recently installed military government in Lesotho[7]. The Treaty sets out the quantities of water to be delivered, the calculation of royalties and the provisions for cost sharing. The purported objectives of the project are to:

- Transfer surplus water from the Lesotho highlands to South Africa for royalties
- Generate hydropower in Lesotho
- Promote economic development of both states.

Initial international funding was provided by the World Bank (along with a number of other aid agencies and the European Investment Bank)[11] through Lesotho, since sanctions were imposed on apartheid South Africa at the time of the establishment of the institutions under the 1986 Treaty.

From the start the LHWP was designed to serve the water needs of South Africa. The overall scheme was designed to eventually comprise of 5 dams, over 200km of tunnels, and a 72-megawatt hydropower plant for the supply of electricity to Lesotho[12]. To date, only Phase 1 of the project has been completed, which includes the 185m Katse Dam, the 145m Mohale Dam, as well as the hydropower plant and the transfer and delivery tunnels to South Africa.

[11] 2002. Hilyard. *The Lesotho Highlands Development Project – What went wrong?*

[12] 2005. International Rivers Network. *A brief history of Africa's largest water project.*

Construction, which created thousands of jobs and provided substantial revenue to Government through import duties, commenced in 1989. The first water was delivered from the Katse Dam (Phase 1A) in 1998. This provides close to R20 million per month in Royalties to Government of Lesotho. Power production from the Muela power plant began at the same time, making Lesotho virtually self-sufficient in electricity. The Mohale Dam (Phase 1B), linked to Katse by a tunnel, was inaugurated in 2004. Feasibility studies are currently underway for Phase 2 of the project.

Only in recent years have the needs of the Lesotho Lowlands become more evident, prompting fundamental questions to be asked about how subsequent phases of the scheme might be adjusted to take into consideration Lesotho's own requirements. Any changes would, of course, have major implications for the treaty and for the current institutional arrangements.

The LHWP has been extensively criticised as a result of the massive social upheaval caused by the project in Lesotho. Although fewer than 1,000 households had to be resettled a far large number (around 27,000) lost access to valued resources in the areas inundated by the two dams as well as downstream of these.[13] Despite $62,000 being spent per households resettled from the Katse Dam, and over $30,000 per household for Mohale Dam (higher than any other World Bank funded project worldwide), the resettlement process is said to have been plagued by problems including corruption, lack of adequate basic services in resettled areas, inadequate compensation for displaced people and tension between resettled people and residents of the resettlement areas[7].

During construction, the influx of thousands of people into the area brought AIDS, prostitution and alcoholism to previously isolated communities. Furthermore, in certain cases, resettlement did not take place before construction began leaving many displaced people homeless, and the process to recreate lost livelihoods has been slow and inconsistent. There was also significant loss of arable and grazing land as a result of large-scale inundation.

Assessing the likely environmental impacts of the project has been complicated, partly because the national legal and institutional arrangements were not in place at the start of

[13] 2006, Transformation Resource Centre, *On the Wrong Side of Development: Lessons Learned from the Lesotho Highlands Water Project.*

the project, and are still not complete although progress has been made. There was no formal environmental impact assessment (EIA) for Katse Dam. The absence of a formal EIA for Katse Dam as in 1986 this was not a national requirement and the environmental impact assessment capacity was very limited. Institutional and legislative developments since then have ensured that no similar project could be developed today without an EIA (a detailed EIA was conducted for Mohale Dam). However, Lesotho still does not have a Lesotho Environment Authority or a national compensation policy, the absence of which undermines EIA assessments and monitoring.

Although much criticised, the LWHP is ironically well known for developing methods for assess the in-stream flow requirements (now usually know as environmental flows) for the rivers below Katse and Mohale Dams. A multidisciplinary team of biophysical, social and economic experts carried out a complex assessment in the late 1990s of the impacts that different flow scenarios would have on the downstream environment and the people who depend on its resources. The results of this showed a need for significant sums to be paid in compensation for a likely decline in river-dependent natural resources, notably shrubs. However, there have been significant delays in payments because of a lack of clarity regarding what local institutions should be responsible for handling the money (new community councils are an avenue now being considered). The emerging lesson is that the institutional aspects of compensation need be carefully examined well in advance of such projects.

The Government of Lesotho is well known for having successfully prosecuted its own officials and several large foreign companies for corruption in cases associated with the LHWP. This has resulted in the World Bank suspending contracts to major international engineering firms after findings that they were guilty of paying bribes. For example, in 2006, the World Bank's sanctions committee found that Lahmeyer International had engaged in corrupt activities by bribing the LHDAs then chief executive, Mr Masupha Sole, who was the government official responsible for contract award and implementation under the LHWP, in violation of the Bank's procurement guidelines[14].

To a certain extent, the difficulties experienced by the LHWP can be traced back to institutional problems. Resettlement and compensation are recognised as being

[14] See http://www.probeinternational.org/

extremely contentious issues in all big dam projects. International experiences indicates a need for high levels of political will, staff capacity, funding, community participation and development opportunities for there to be any measure of success. In the case of the LHWP project it has been argued that, from the start, political will was not sufficient as the award-winning engineering components always appeared to receiver higher priority than the social aspects; that capacity was inadequate and was not enhanced in a timely manner; that budgets for development projects, notably health and agriculture, were insufficient and that "inability to allocate expenses between the governments of South Africa and Lesotho" adversely affected implementation of resettlement and other programmes. This experience points to a need for the institutional aspects of multinational projects to be very carefully hammered out well in advance of project implementation.[15]

Looking ahead, there is increasing evidence that the implementation of water demand management practises in South Africa could significantly reduce the amount of water needed from Lesotho, and that further phases of the project may not be necessary. Currently, however, a feasibility study for Phase 2 of the LHWP is underway. If this is to serve the needs of the Lowlands of Lesotho new institutional arrangements will need to be considered for bulk water supply management.

Some of these issues discussed above can be addressed in a more integrated manner through the IWRMP, and it is therefore important to learn from the problems that this project has generated, in order to improve the effectiveness, sustainability and equity in the implementation of other projects on the Orange-Senqu Basin.

[15] 2006, Thayer Scudder. *Assessing the Impact of the LHWP on Resettled Households and other Affected People: 1986-2005.* In *Ibid.*

4 EXISTING INSTITUTIONAL STRUCTURE

4.1 National Structures

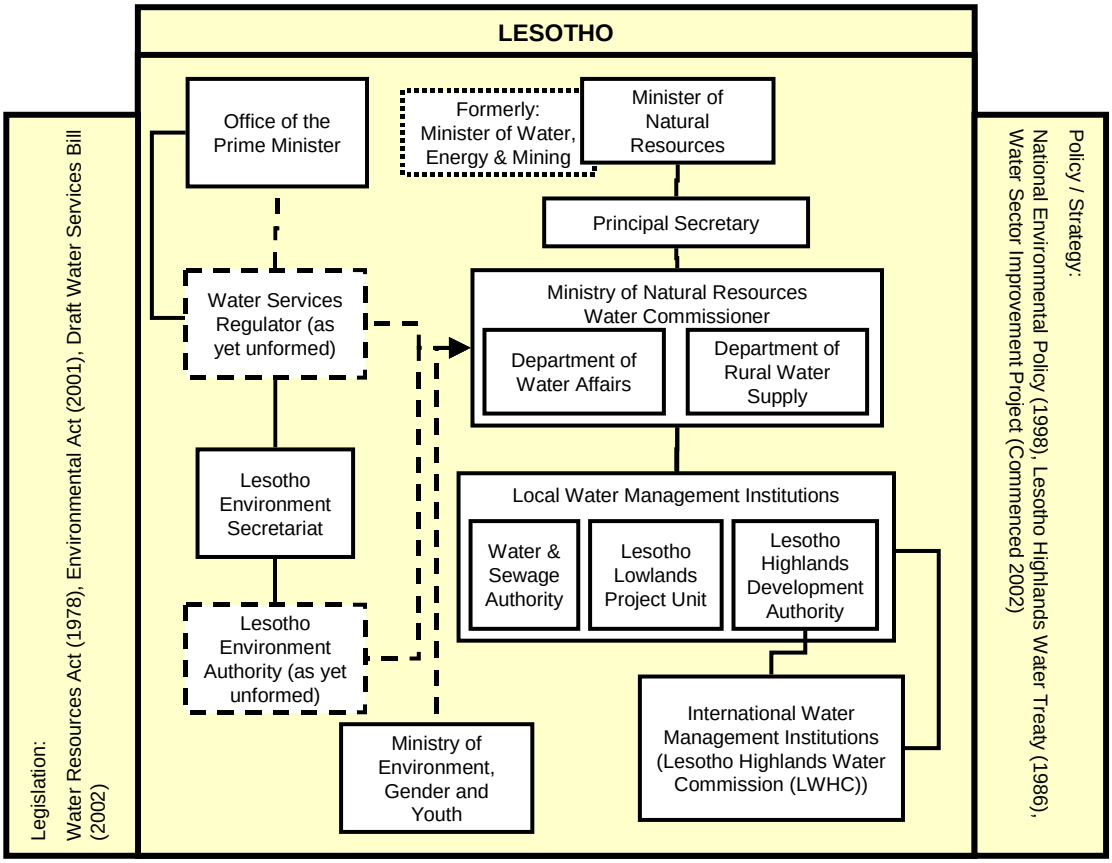
4.1.1 Lesotho

The Ministry of Natural Resources is the organ of state responsible for formulating policy and legislation with regard to water resources. All water uses (except domestic use) must be licensed, and domestic uses have priority. Most of the population lives in the Lowlands and experiences frequent water shortages[5], despite the plentiful supply in the Highlands.

Water management in Lesotho is impacted by the Lesotho Highlands Water Treaty, and the institutions it established, as can be seen from the diagram in **Figure 4-1**. Consequently, these institutions must be included in any discussion of Lesotho water management policy and practise.

Internally, a significant policy framework for water resources is the National Environment Policy (NEP) of 1998. This document sets out the policy and strategy provisions for integrated water management, with strong commitment to environmental sustainability and protection. It includes strategies for demand management and pollution control, as well as providing for the development and enforcement of water quality standards, and the protection of the environment and delicate ecosystems.

The NEP, and the subsequent Lesotho Environment Act (2001), resulted in the established the Lesotho Environment Secretariat (LES) to oversee implementation of national environmental policies. The 2001 Act, although not yet in force, acts as the principle document guiding EIAs and having some influence on the environmental management of water and land resources. The NEP is based on internationally agreed sustainable development principles. Under the 2001 Act there are plans to transform the LES into the Lesotho Environment Authority (LEA), which is to be the primary institution for environmental management. Current institutional capacity constraints are said to be a key reason for the delay in the enforcement of the Act and creation of the LEA.



Source: Krantz *et al. Governance, Institutions and Participation in the Orange-Senqu Basin*. Report to the NeWater Project, Berlin, October 2005.

2006. Lesotho Water and Sewage Authority. *Maseru Wastewater Project – Brief Review of Institutional Arrangements*

2006. D Hall. Pers.Comms. 10/11/2006

Figure 4-1: Lesotho Institutional Structure

Following a Water Resources Policy and Strategy study in 1996, the Commissioner of Water was created to oversee the water sector in Lesotho. The Commissioner falls under the Ministry of Natural Resources, and is responsible for the Departments of Water Affairs (DWA) and Rural Water Supply (DRWS). He is also responsible for setting policy for the Lesotho Highlands Development Authority (LHDA) and the Water and Sewage Authority (WASA). The Policy, Planning and Strategy Unit (PPSU) provides technical support to the

Commissioner.[16] These institutions are still in their infancy, and a World Bank-funded Water Sector Improvement Project is currently underway in Lesotho to strengthen them.

The Department of Water Affairs is the implementing institution for the Water Act (1978) and is generally responsible for water sector administration, policy and data collection. The supply of water to rural communities is the responsibility of the DRWS, while the WASA was established as a parastatal, to manage water supply to urban areas.

The second parastatal overseen by the Commissioner of Water is the LHDA. This organisation is responsible for all aspects of the LHWP within Lesotho and must give effect to the rights and duties of the LHWC. The LHDA is governed primarily by the terms of the Lesotho Highlands Water Treaty. In volume terms, therefore, the terms of the Treaty dominate most of Lesotho's water, although the LHDA can be called upon by the Lesotho government, to provide support to the water sector in Lesotho.

The Local Government Act (1997) provides for local government structures to eventually take responsibility for the delivery of water services, but this is a long way from implementation.

Comment

Whilst it appears that Lesotho has a modern water management framework, there are two significant issues that affect the implementation of this structure. The first is that the policy, legislative and institutional frameworks are in the initial stages of transformation to a more integrated framework. The second is that the technical capacity to implement this framework is limited in Lesotho. This situation could affect Lesotho's contribution regarding the use of this basin at international level, if much of its available technical capacity is concentrated on local issues.

4.1.2 South Africa

The major changes in South Africa's political regime in 1994 carried through to water management issues in the sense that riparian rights (ownership) were removed from private individuals, and the national government, through the Ministry of Water Affairs and Forestry, became the custodian of the nation's water. Thus the Minister of Water Affairs

[16] 2002. Lesotho Water and Sewage Authority. *Maseru Wastewater Project: Brief Review of Institutional Arrangements.*

and Forestry holds the responsibility for the management of South Africa's water resources.

The Minister retains the functions of specification of international water obligations, contingency planning for future needs and authorising inter-basin transfers or water uses of strategic importance. All other functions are delegated to officials in the Department of Water Affairs and Forestry (DWAF).

The DWAF is responsible for the functions relating to implementation of the two major legal instruments relating to water, the Water Services Act No. 108 of 1997, and the National Water Act No. 36 of 1998 (NWA). The NWA was derived from the National Water Policy, the fundamental principles of which are that of equitable allocation, sustainability and environmental protection. The means by which the NWA is to be implemented, is through the National Water Resource Strategy (NWRS). The NWRS has 4 main objectives[17]:

- To establish the national framework for the protection, use, development, conservation, management and control of South Africa's water resources.
- To establish the framework for the formulation of catchment management strategies.
- To provide information to the public.
- To identify opportunities and constraints (given that South Africa is considered an arid country and that water resources are limited).

Under the NWA, the NWRS must also contain objectives for the establishment of institutions to manage water and determine the inter-relationship between those institutions[18].

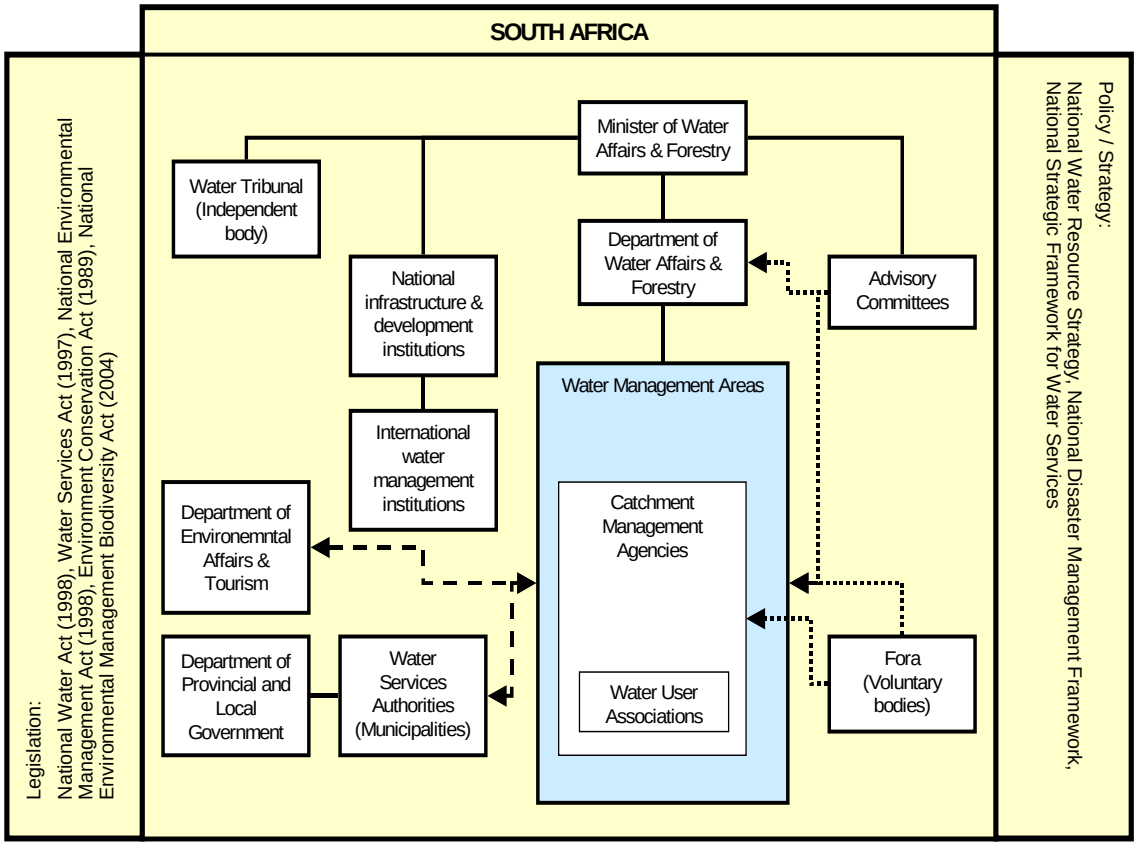
Figure 4-2 outlines the major institutions, and their related legislation and policy for water management in South Africa. Following the promulgation of the above acts, South Africa's institutional structure for the management of water resources changed dramatically. Most significant, was the move to integrated management, with the catchment as the basic unit of management (regional level management). This resulted in the delineation of 19 water

[17] 2002. DWAF. *National Water Resource Strategy*

[18] Undated. DWAF. *Overview of Water Management Institutions*

management areas (WMAs) in South Africa. (The Orange-Senqu Basin in South Africa spans five of WMAs: the Upper and Lower Orange, and the Upper, Middle and Lower Vaal WMAs.) These water management areas will eventually become the responsibility of the Catchment Management Agency (CMA) in that area, a function that is currently undertaken by the DWAF.

The Catchment Management Agencies have a legal identity and are (or will be) responsible for administering and implementing the catchment management strategy (CMS) for their area, which must be in accordance with the NWA and the NWRS. This strategy must be formulated with extensive stakeholder consultation, which may take place through the establishment of non-statutory bodies such as Catchment Management fora, or Catchment Steering Committees. CMAs comprise the Governing Board, temporary standing committees (for matters of particular interest or import), committees (e.g. executive committee), a chief executive officer and the general staff, and their principal objective is to devolve water management responsibilities to a regional level through the stakeholder participation process which is integral to their establishment. The NWA regulates the management and planning of a CMA, and all CMAs must submit business plans and annual reports to the Minister.



Source: South Africa DWAF. *National Water Resources Strategy, First Edition*. September 2004

Krantz *et al. Governance, Institutions and Participation in the Orange-Senqu Basin*. Report to the NeWater Project, Berlin, October 2005.

Figure 4-2: South Africa Institutional Structure

Furthermore, the NWA provides for Water User Associations (WUAs) to be set up as localised bodies (within a particular WMA), and they may or may not have water management activities devolved to them. They are defined as "associations of individual water users that undertake water related activities for mutual benefit", and are statutory bodies – i.e. have a legal identity. There are two types of WUA, one sector-based – comprising members with similar water uses, and multi-sectoral, acting in the interests of members with a number of different water uses. WUAs can only be established by the Minister under the procedures set out in the NWA, and must include a public consultation process.

There are also advisory bodies which are be formed to advise the Minister on the particular issues, such as the Board of a CMA, or the Advisory Committee on the Safety of

Dams. Institutions may be established for the management of infrastructure or development projects that traverse regional or national boundaries.

Other institutions mentioned in the NWRS are those established for international water management. This does not refer to bodies such as ORASECOM, which is an international organisation, but rather to those national institutions that are implementing organisations for the provisions of an international treaty. An example of such an institution is the Trans-Caledon Tunnel Authority (TCTA) (para. 3.1.2). A second such institution, established under the 1956 Water Act, and now repealed, was the Vioolsdrift Noordoewer Joint Irrigation Authority, which now falls under the PWC (para. 3.1.1).

The Water Tribunal is an independent body, established by the Minister under the NWA, and deals with appeals against any administrative decisions made by the water management institutions described above.

In addition, the Department of Environmental Affairs and Tourism (DEAT) has links to water resources, since the provisions of the NWA must be in accordance with environmental policy through the National Environmental Management Act (NEMA) of 1998. Formal mechanisms exist for this, in the form of the Consolidated Environmental Implementation and Management Plan, drafted by the DWAF, and requiring review every 4 years, and DWAF contributions to the State of the Environment report prepared by DEAT.

Finally, the Municipal Structures Act of 1998 gave the responsibility of the delivery of water services (water supply and sanitation) to District Municipalities through the establishment of Water Services Authorities. These institutions can have a significant impact on water resources, as they are responsible for the management of effluent return to water resources, water quality issues in their area of jurisdiction, and abstraction of bulk supply from water resources in, and outside, their area. Infrastructure that was previously managed by the DWAF for the above functions, is now in the process of being transferred to the ownership of local government institutions across the country. Each WSA must complete a Water Services Development Plan to address their service supply backlogs, as well as provide an annual report to the Minister of Water Affairs (through the DWAF).

Comment

South Africa has a progressive, but complex legislative and policy framework, and hence, institutional structure, for the management of her national water resources. Its

implementation, however, is progressing slowly, with most of the CMAs not yet established despite the NWA having been promulgated 8 years ago. The NWRS, which gave effect to the provisions of the Act, was completed in late 2004, and infrastructure remains to be transferred to the WSAs.

Although strategic frameworks for the management of most of the WMAs have been prepared by the DWAF (in the form of an Internal Strategic Perspective or ISP document), these do not fulfil the terms of the NWA, in the sense that they must be prepared by the CMAs, which are considerably more representative of the stakeholders of the area than the DWAF. The NWA provides that stakeholders, especially previously disadvantaged and marginalised stakeholders, must have the capacity to participate effectively in water management; a time-consuming process. Capacity is also an issue with regard to the WSAs, and infrastructure is often obsolete or in bad repair.

Furthermore, there are constraints with regard to the implementation of the Ecological Reserve according to the NWA, as well as the licensing system, under which all existing uses must eventually be documented and review according to the provisions of the NWA. These two processes are both enormous and costly exercises, which must also be integrated, and then managed by CMAs, which will be newly formed organisations. Given that there are five WMAs within South Africa that relate to the Orange basin, and at least 20 WSAs, including the powerful Gauteng Municipalities governing the cities of Johannesburg and Pretoria, South Africa's institutional structure in the context of the Orange-Senqu Basin, is highly complex. As a result, at international level, the protracted time frame in which these processes are taking place, and the complexity of the institutional structure could impact on the implementation of an adequate integrated management strategy in the international context.

4.1.3 Botswana

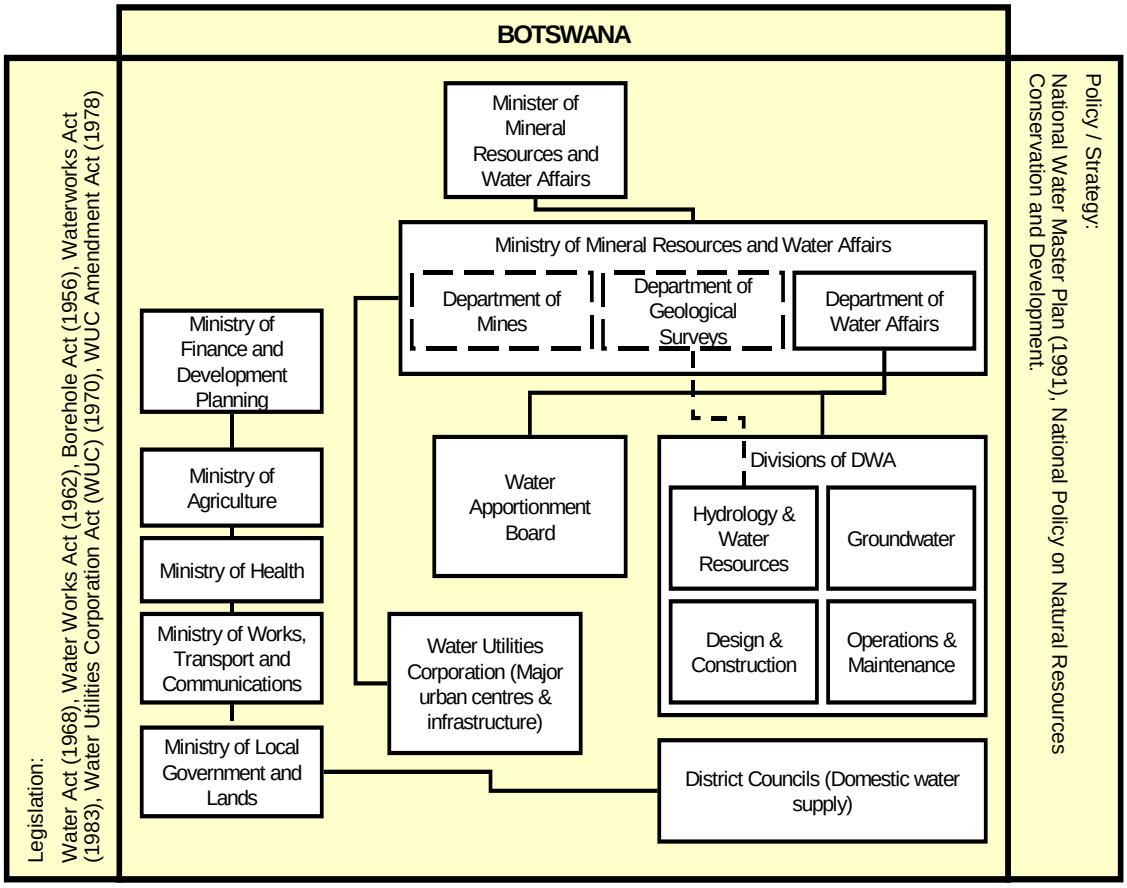
The principal institution for the management of water resources in Botswana is the Ministry of Mineral Resources and Water Affairs (MMRWA). According to the Botswana National Water Master Plan (NWMP)[19], the organisation's broad functions are policy development, planning and liaison with related Ministries. There are a number of departments and

[19] 1991. SMEC et al. *Botswana National Water Master Plan Study.*

parastatal organisations that fall under the MMRWA. **Figure 4-3** sets out Botswana's institutional structure as it relates to water.

The Department of Water Affairs (DWA) is responsible for hydrological data, water resources development, water supply to major villages and the design and investigation of supply to rural villages and the servicing and support of the Water Apportionment Board (WAB). Given that the people living in the Botswana portion of the Orange-Senqu Basin are predominantly dependent upon groundwater, the Department of Geological Surveys (DGS) is of particular significance. The DGS is responsible for the administration and management and research of groundwater resources under the Boreholes Act. The groundwater division of the DWA works closely with the Hydrogeological division of the DGS, and is responsible for drilling for and siting of small-scale water supply schemes.

The Water Apportionment Board (WAB) is a quasi-judicial body, which is responsible for the administration of water use licenses and rights. The Minister of MRWA appoints its members, who include representatives from other Ministries, but in practice it is operated by the DWA, whose Director is the WAB Secretary and Water Registrar. All major water abstractions from surface and groundwater resources must be approved by the WAB, and major mines are required to produce bi-annual reports on water quality. The DWA also began producing these reports for the groundwater supply to major villages in 1991.



Source: Botswana DWAF. *Botswana National Water Master Plan Study: Volume 7 – Institutional Aspects*. July 1991.

IUCN ROSA et al. *Sharing Water – Towards a transboundary consensus on the management of the Okavango River: River Basin Management Governance*. March 2004

Figure 4-3 Botswana Institutional Structure

The Water Utilities Corporation (WUC), a parastatal entity that falls under the MMRWA, is responsible for the supply of water to the urban centres, having taken over from the Water and Electricity unit in 1970. It is chaired by the Deputy Permanent Secretary of the MMRWA and representatives from other relevant Ministries serve on its Board. The WUC operates the major dams and the North-South carrier (from the Limpopo Basin), in addition to several well fields.

Other Ministries relevant to water resources management in Botswana include the Ministry of Local Government and Lands (MLGL), whose responsibilities include the operation of water supply to the rural villages through the District Councils. In practice, this occurs with significant support from the DWA. The MLGL is also responsible for land use planning,

environmental investigations and the preparation of the National Conservation Strategy. The Ministry of Finance and Development Planning (MFDP) allocates funding for water development projects and water resource studies, and the Ministries of Health and Agriculture have obvious links, the latter through its Small Dams construction and Irrigation sections and the former with regard to water quality standards. Finally, the Ministry of Works, Transport and Communications collects and processes meteorological data.

Community based formal structures include the *kgotla*, which is in essence a Community Meeting Forum. Disputes over water supply or water requirements in the rural areas may be addressed in such fora.

Comment

Botswana is a dry country, and surface water resources, particularly in the area of the Orange basin, are limited. National institutional arrangements for water management are fairly cumbersome, with some significant areas of overlap; both the legislation and institutional structures are now more than 15 years old, and require updating. It is also important to note that Botswana's institutional arrangements do not reflect the catchment as a management unit, although the Water Apportionment Board is involved obliquely at the catchment level. This structure, and the legislation that establishes its institutions, requires extensive review and coordination, as well as the establishment of the catchment as the management unit. The NWMP is currently under review, and this should be coordinated with the IWRMP in order to maximise the coordination of the national structure at international level, especially given that Botswana's major surface water resources are shared watercourses.

4.1.4 Namibia

Under a United Nations mandate, until 1990, Namibia was a protectorate under South African stewardship. As a result, much of the earlier legislation applicable in Namibia has its origins in South Africa.

Namibia's institutional arrangements for water resources management are currently in the throes of transformation, and as such, this institutional map will present two scenarios, the situation under existing legislation, and the emerging situation under the new Draft Water Bill, according to the National Water Policy adopted in 2002[5].

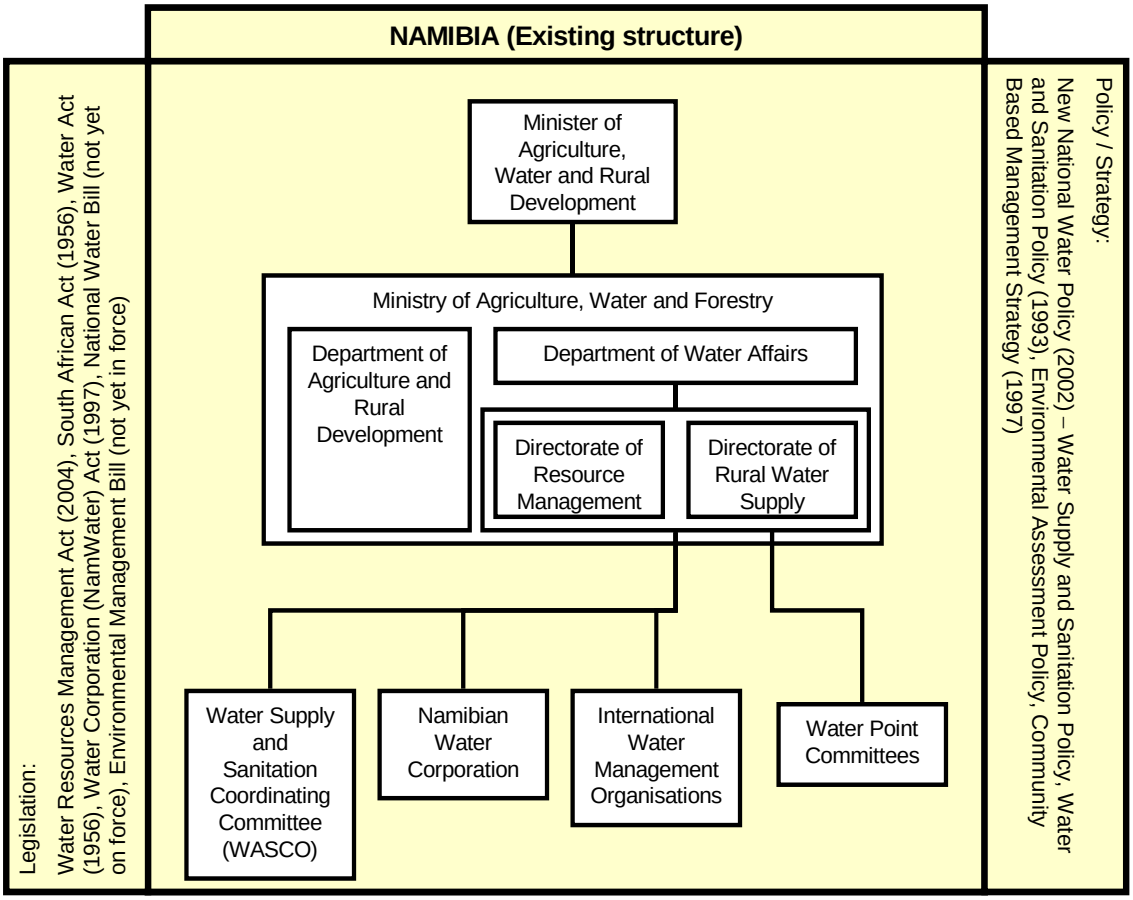
Under the existing structure, the Ministry of Agriculture, Water and Rural Development (MAWRD) (previously the Ministry of Agriculture, Water and Forestry (MWAF)) holds

overall responsibility for the management of the nation's water resources. The Ministry comprises two main departments, the Department of Agriculture and Rural Development (DARD), and the Department of Water Affairs (DWA). The MAWRD is responsible for broad policy setting and overall coordination of agricultural and water issues to achieve the National Development Plan (NDP) (1997) objectives[20].

The DWA comprises two directorates as set out in **Figure 4-4**, the Directorate of Resource Management (DRM) and the Directorate of Rural Water Supply (DRWS). The DRM carries out the overall management of water resources according to the existing legislative framework (South African Water Act 1956). The DRM is therefore, for practical purposes, the custodian of Namibia's water resources. In this capacity, the DRM is responsible for the implementation of measures to ensure sustainable use and protection of water resources, the control of abstraction and water allocation and carries out the functions of planning and regulation of the water sector. Currently this Directorate is attempting to achieve these goals on the basis of an outdated legislative framework, but this should improve considerably once the National Water Bill is enacted. (The Water Resources Management Act was promulgated in December 2004, but implementation has not yet commenced[21].

[20] Undated. MWAF Official Website. Available at: http://www.op.gov.na/Decade_peace/agri.htm

[21] This information was received through email communications with Ms Maria Amakali (14/11/2006), but was received too late to be integrated into this report. Subsequent reviews or projects must, however, take this into account.



Source: Namibian Ministry of Agriculture, Water and Forestry official website. http://www.op.gov.na/Decade_peace/agri.htm

IUCN ROSA et al. *Sharing Water – Towards a transboundary consensus on the management of the Okavango River: River Basin Management Governance*. March 2004

Figure 4-4: Namibia's existing institutional structure

The DRWS is responsible for the supply of water to the rural or communal areas in Namibia, and its objectives are set out in the NDP. The NDP represented a move to community-based water management and established Water Point Committees, which are staffed with trained local representatives. It is estimated that over 1000 water point committees have been established and trained since the strategy was formulated in 1997[20]. The DRWS is also responsible for assisting the rural communities with the installation and maintenance of water supply infrastructure.

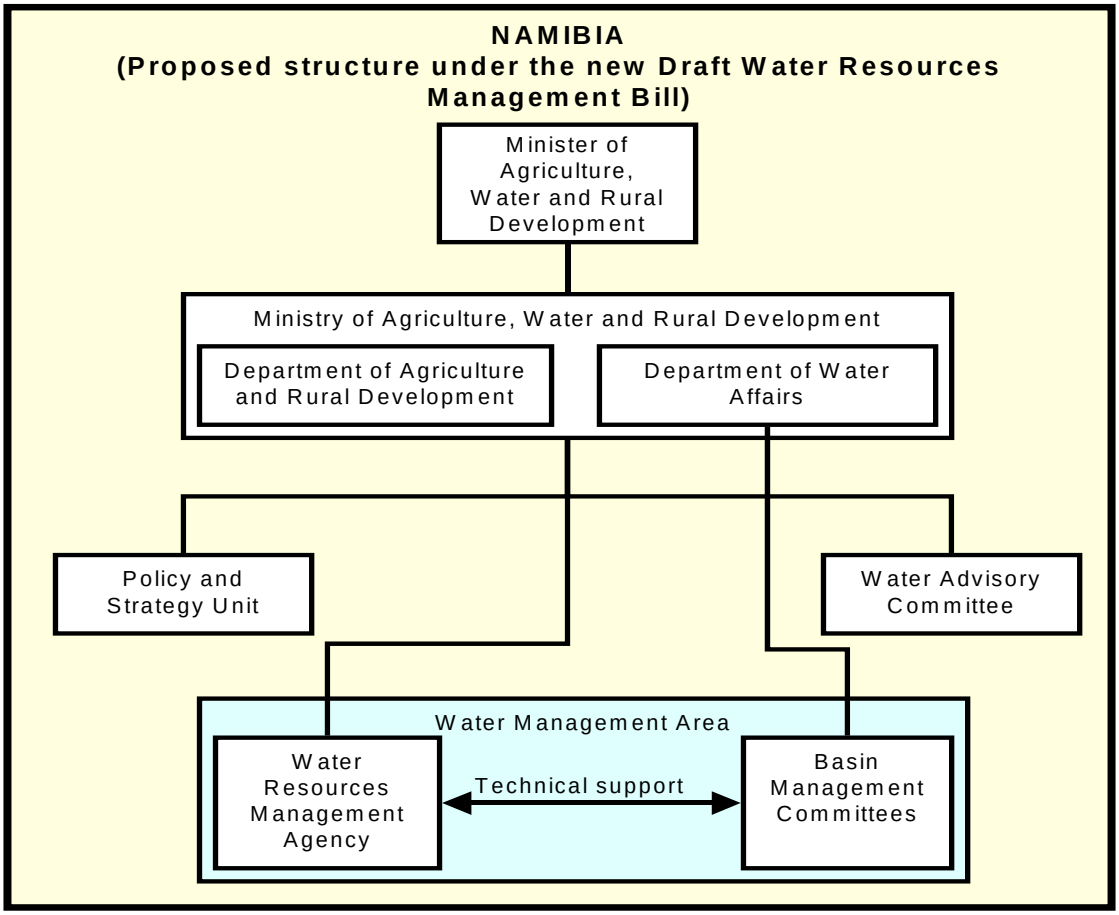
The Namibian Water Corporation Act (NamWater Act) of 1997 established the NamWater parastatal organisation which begun operating in 1998. Its objectives are the bulk supply of water consumers throughout Namibia, primarily through the local authorities.

The Water and Sanitation Policy of 1993 recommended the establishment of a Water Supply and Sanitation Coordinating Committee (WASCO), which was approved by Cabinet in 1995. It is the mechanism for coordination of the water sector in Namibia and falls under the DWA.

Finally, Namibia is party to a number of international agreements, including the Helsinki Rules on Shared Watercourses, the UN Convention and the SADC Protocols on Shared Watercourses. Representatives to multilateral and bilateral organisations of which Namibia is a member are responsible for the internal application of the provisions of the agreements that established them.

The proposed structure (**Figure 4-5**) under the Draft Water Resources Management Bill represents a move toward the catchment (or basin) as the unit of management in Namibia, in a more integrated framework[22]. The Bill attempts to address the problems generated by the fact that all of Namibia's interior rivers are ephemeral, and their flow is influenced by the condition of the catchment. To this end, the establishment of Basin Management Committees (BMCs) is proposed by the Bill. These will be statutory bodies, established by the Minister and should incorporate the current community-based and coordination structures (WASCO and Water Point Committees).

[22] 2002. Amakali & Shixwameni. River Basin Management in Namibia.



Source: Akamali, M. and Shixwameni, L. *River Basin Management in Namibia*. Paper presented to: 3rd Waternet/WARFSA Symposium. Dar-es-Salaam. October 2002

Figure 4-5: Namibia's proposed institutional structure

Technical support to the BMCs will be provided by the Water Resources Management Agency (WRMA), which falls within MAWRD, and will also be the regulating authority. The BMCs, with the support of the WRMA, will be responsible for the formulation of management plans at the level of the basin and incorporating extensive stakeholder participation. These plans will then be coordinated by the Policy and Strategy Unit (PSU), which will be responsible for overall national planning and policy formulation. The PSU will also provide the guidelines for all BMC plans.

Finally, the Water Advisory Committee (WAC) will be established to advise the Minister on all aspects of water resource management. All BMCs will be represented on the WAC.

Comment

The proposed structure represents an integrated management framework at catchment level in Namibia. This requires a significant revision of outdated structures, and the policy and legislation that established them. However, it is modelled on the South African structure, which is complex and has already had considerable problems in its implementation. The concern therefore, is Namibia's capacity to implement the Bill, given the problems South Africa, considered to be generally better funded and with greater technical capacity, has already had[5].

For the IWRMP for the Orange-Senqu Basin, however, the current and ongoing transformation of Namibia's institutional structure at national level represents an opportunity to integrate with international principles of water management in a process concurrent with the revision of international structures for improved management of shared watercourses. This could save costs and also represents the possibility for Namibia to take into account issues raised in the South African transformation.

4.2 International Structure

The Permanent Water Commission (para. 3.1.1) and the Lesotho Highlands Water Commission (para.3.1.2) are both bilateral agreements, and, while they are international structures, they do not correspond to the international context with regard to the management of shared watercourses. There are various overarching international institutions that have determined the policy and legislative framework by which international basins in Southern Africa (and generally) should be managed. The Orange-Senqu River Commission (ORASECOM) was established in November 2000 as a result of the evolution of this policy context. ORASECOM includes representation from all four basin states under the terms of the ORASECOM Agreement (2000). **Figure 4-6** represents the existing institutional framework for the Orange-Senqu Basin.

4.2.1 The International context

The Helsinki Rules, formulated by the International Law Association in 1966, set out factors that should be applied in determining what constitutes equitable utilisation of shared water resources. Given the multifaceted nature of water resources, it is not unexpected that refining of these rules into an agreed United Nations Convention, took 25 years.

The UN General Assembly adopted the UN Convention on the Law of the Non-Navigable Uses of International Watercourses in 1997. It represents the codification of the rules of customary international law as regards shared watercourses. It established three critical principles in the use of shared watercourses. They are:

- The principle of equitable and reasonable utilisation according to a number of factors including social and environmental factors. This principle states that these must be considered on a case-by-case basis (Article 6)
- The principle of obligation not to cause significant harm (Article 7), which protects downstream users of the watercourse from upstream development or utilisation. This principle introduces the possibility of compensation in the event that serious harm is caused
- The principle of prior notification in the event of planned measures that may "have a significant adverse effect upon other watercourse states" (Article 12)

These principles essentially obligate basin states to institute a framework for extensive cooperation, information exchange and impact assessment in their uses of international watercourses.

The Revised SADC Protocol on Shared Watercourse Systems (2000) (The Protocol) was formulated by the regional organisation, the Southern African Development Community (SADC). This protocol was originally signed in 1995, as part of the implementation process of the SADC Treaty (promoting cooperation between 14 member states in the Southern African region).

In 2000, however, the 1995 Protocol was revised to bring its provision in line with the UN Convention and to strengthen the principle of integrated management of shared watercourses, with specific provisions regarding equitable utilisation, planned measures, no significant harm, and emergency situations[5]. The Protocol also makes provision for the establishment of "shared watercourse institutions" (Article 5(3)) and "joint management mechanisms" (Article 4(3)).

Although The Protocol provides the framework principles on which shared watercourse management institutions in the Southern African region should be based, it does not provide specifics on a model institution. Any institution established in the SADC region, however, must implement its general principles as the Protocol has been ratified and is

therefore binding on its signatories (which include the four basin states on the Orange-Senqu). The SADC has also recently (in 2005) established a Tribunal, in order to address regional disputes.

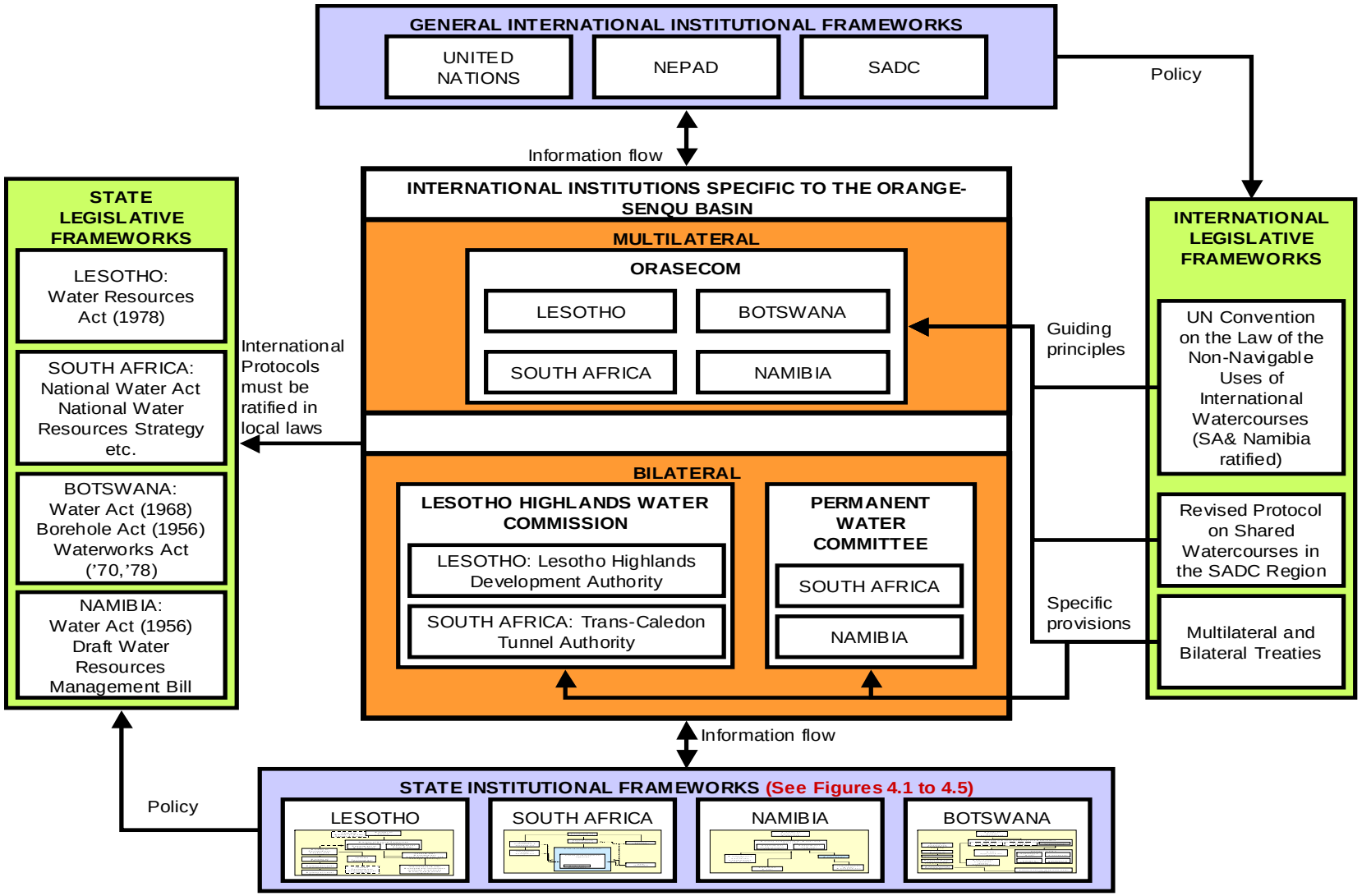


Figure 4-6: Orange-Senqu existing institutional framework

Finally, the New Partnership for Africa's Development (NEPAD) has established development objectives, relating to water resources. They are as follows[23]:

- Sustainable access to clean water and sanitation, especially for the poor
- The planning and management of water resources as a basis for cooperation and development at national and regional level
- The protection of ecosystems, biodiversity and wildlife
- The cooperation on shared rivers of basin states
- Addressing the threat of climate change
- The improvement of sustainable agricultural production and food security through enhanced irrigation and rain-fed agriculture .

These international institutions provide the setting for multilateral institutions for established for a specific set of conditions, such as the equitable use of the shared water of the Orange-Senqu Basin.

4.2.2 The Orange-Senqu River Commission (ORASECOM)

ORASECOM is considered an international organisation with an international and national legal personality. While it does provide a forum for discussion between the basin states and is empowered to advise their governments on technical issues relating to the Orange-Senqu Basin, it is not directly aligned with the principles of international water management outlined above, specifically to the SADC Protocol[5].

It encourages communication on basin issues between the member states through the mechanism of an annual meeting of the representatives of the states, and provides that the basin states must utilise the resource within their respective states equitably and reasonably (according to the SADC Protocol). It also operates as a funding coordinator for joint basin projects. ORASECOM serves as a technical advisor to the member states and can execute the necessary feasibility studies to support decision-making.

It does not, however, have any direct links (through formal mechanisms) with the bilateral organisations (the LHWC or the PWC), although the basin states are required to inform ORASECOM of any issues pertaining to the basin, changes to agreements or impacts on

[23] 2001. NEPAD. *NEPAD framework document*.

the waters of the basin. Furthermore, the Commission does not set out criteria for equitable allocation, which is subject to negotiation at political level, and if there is no agreement within the Commission about a proposed project, it is also subject to negotiation at political level.

Comment

The current structure of ORASECOM therefore contradicts the integrated framework provided for in the broader international instruments, specifically the SADC Protocol, which is binding on all four of the Orange-Senqu basin states. As it is currently structured, ORASECOM essentially provides a forum for discussion on basin issues and operates as a funding coordinator.

Current international water management research has generated some key criteria which IRBM organisations should fulfil, in order that they improve the effectiveness of the management regime of the basin in terms of sustainability and equity. In the following paragraphs, the existing structure of the Orange-Senqu Basin will be evaluated against those criteria, as a basis for discussion in terms of improving the effectiveness of the implementation of the IWRMP.

5 POTENTIAL FUTURE INSTITUTIONAL STRUCTURE

5.1 General characteristics of integrated basin management institutions

Numerous studies have taken place on the world's some 300 international basins over the past few decades[24], resulting in an overwhelming consensus that integrated management is the key to sustainable international river basin management. This extensive international experience can be drawn on to assist ORASECOM to devise appropriate basin management methods and structures in the years ahead. For this reason the key lessons emerging from international experience are noted below and discussed in relation to the Orange-Senqu Basin.

The key characteristics of integrated management organisations are as follows[25,26]:

- Provision of a common forum for meeting - in order that issues can be discussed regularly among representatives from each basin state and to promote understanding between the relevant parties.
- Promotion of information sharing among the relevant states and organisations – in order that a catchment-wide database can be maintained, and historical data stored.
- An adaptable management structure incorporating participation at deeper than state level – to allow for changing conditions in the basin and emerging data, as well as some degree of public participation. This will enhance the effectiveness of the implementation of a management plan.
- The existence of a coordinated water resource management plan – to ensure that realistic management objectives are met in a basin-wide context.
- Adequate financing and the ability to secure funding from donor agencies – financing of the organisation itself will ensure continuity and effective operation,

[24] Studies include the Global International Waters Assessment (GIWA) a series of case studies conducted through UNEP, the NeWater project (EU project to develop and international basin management toolkit), the Transboundary Freshwater Atlas (UNEP), the Global Environmental Outlook (GEO-4) project (UNEP) and many case studies, in basins such as the Nile, the Mekong, the Aral Sea, the Jordan basin etc.

[25] 2002. Nakayama. *Institutional Aspects of International Water System Management*.

[26] 2002. Giordano and Wolf. *The World's International Freshwater Agreements: Historical Developments and Future Opportunities*.

as well as enhancing the organisation's ability to secure adequate funding for necessary projects and the implementation of its management plans and objectives.

- Clear and flexible water allocation criteria – clear allocation schedules and quality standards that incorporate the changing conditions of the basins, as well as providing for extreme events.
- Equitable distribution benefits (and the costs) of water use throughout the basin – distributing the benefits of water use rather than dividing the water itself lends flexibility to allocations and the ability to manage changing basin dynamics, as well as facilitating management of the system as a whole.
- Clear and effective conflict resolution mechanisms – in order that, when disputes arise, the management objectives of the basin are not compromised.

5.2 Potential discussion issues for ORASECOM in the context of these characteristics

ORASECOM does provide a forum for discussion of basin-related issues among the member states. Currently these meetings are limited in number and for state representatives only. While this addresses the promotion of understanding between parties, the limited number of meetings may not be sufficient for a basin with the degree of complexity of the Orange-Senqu, especially considering that national institutional structures are currently in a state of transformation or review, as noted earlier. International experience suggests that there is a need to move fairly rapidly from limited meetings to the creation of a forum that allows for more frequent exchanges of views and information.

While ORASECOM supports information sharing among the basin states, and the annual meeting is a discussion forum at which information would be communicated, a more systematic approach to information sharing could significantly reduce communication costs. An issue for discussion with ORASECOM may be to create a database to be housed at ORASECOM that can be accessed at different levels, by different users. The parameters for what information is shared, when it is shared and with whom it is shared would then need to be established.

In order to ensure flexibility and deeper participation, bringing ORASECOM into alignment with the provisions of the SADC Protocol, it is important to review the state-level

management structure. At the time of writing, no permanent Secretariat had yet been established, (although there are unconfirmed reports that the formation of a Secretariat is currently underway). An issue for further discussion and investigation are the operational guidelines for the Secretariat, which includes the study of mechanisms for deeper participation, and for linkages with other international institutions in the basin (the LHWC and PWC). The ORASECOM agreement provides for the process by which all basin states are informed of any developments in the basin, which would include those occurring under the LHWC or PWC.

With regard to a coordinated management plan for the basin, this project comprises Phase 1 of the preparation of the IWRMP, but significant review of both the legislative[5] and institutional frameworks should take place to support its development, and ensure its effective implementation. A review should include an assessment of the implications for international structures, of changes to national structures.

ORASECOM is able to secure donor funding for basin projects, it has done so in the case of the IWRMP, but the organisational funding is not clear in the absence of a Secretariat. The organisational costs should not necessarily be borne equally by the basin states, but based on the distribution of benefits of use of the basin, including cost recovery from users within each nation. The costing structure for the Secretariat, and any potential future aspects of ORASECOM is therefore an issue for further study.

The ORASECOM agreement states that equitable utilisation should take place in accordance with the SADC Protocol principles. These principles were generated at international level and are effectively allocation principles rather than practically applicable guidelines in the basin-specific context. Therefore, ORASECOM could support the implementation of the IWRMP, as well as make a significant contribution to the management of international waters generally, by initiating a participative process to establish basin-specific allocation criteria.

The concept of equitable distribution of the benefits of water use, rather than distribution of the water itself is relatively new, and as such, in-depth study is required to assess the benefits of water use on this basin in an integrated manner. The implementation process of the IWRMP could address this.

The principal mechanism for dispute resolution for ORASECOM, other than consultation, is the SADC Tribunal, which was established in 2005. This Tribunal is a general body, not

specifically related to water issues, and considering the high degree of technical complexity in international water management, may not be an adequate mechanism. Allowing for different levels of dispute could be less costly – addressing smaller issues at the SADC Tribunal may be prohibitively costly. The required level of technical expertise necessary to address disputes is also an issue that could be dealt with more effectively by a more flexible structure (such as an expert panel), which ORASECOM could call upon if necessary.

5.3 Conclusions

ORASECOM provides for interaction at state level only, and does not at this stage have adequate measures to support the implementation of an integrated management plan, incorporating basin-wide issues. Coordination between international organisations in the basin, as well as mechanisms for the incorporation of issues below state level, require extensive discussion and review in order to improve the level of integration in the current structure. **Figure 5-1** sets out a structure that could serve as a basis for such discussion. Such a structure would require the revision of the terms of the ORASECOM agreement as well as changes to the structure of the LHWC and the PWC.

This potential structure requires the formation of a permanent Secretariat, as well as a Coordination Unit, to ensure adequate links between ORASECOM and the LHWC and PWC. The coordination unit could consist of a high-level panel of various disciplines, so as to be able to address political, legal, social, technical and environmental issues, and should also include representatives from a coordination body within the LHWC and the PWC. The coordination unit could be permanent or semi-permanent, in the sense that the relevant member expert panel could be called on when necessary, and able to assemble the required staff for any detailed investigation required. The composition of the coordination unit would need to be agreed upon by the member states, and potential staff identified in detail as part of the formation of the unit. The unit would also require adequate funding in order to ensure its operational effectiveness and continuity.

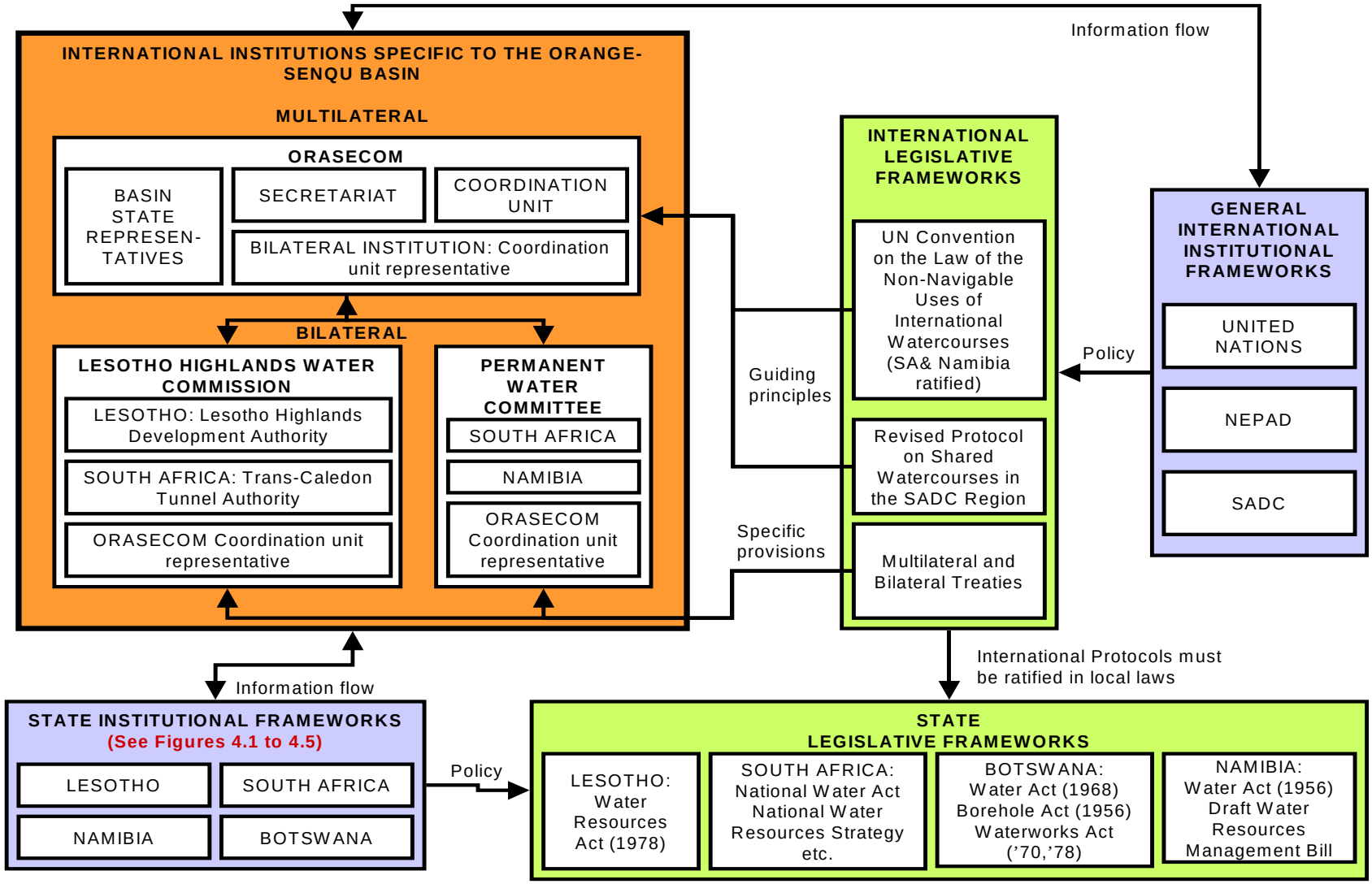


Figure 5-1: Potential future institutional structure for the Orange-Senqu Basin (as a basis for further discussion)

The unit could be responsible for the on-the-ground implementation of the IWRMP, and report regularly to the Secretariat. The Secretariat should be responsible for the operation and maintenance of the basin-wide database, but this may already have been taken into account, since the structure of the Secretariat, which is currently being formed, is not yet known and understood.

High-level state meetings could still be held on an annual basis in terms of the ORASECOM agreement, but including permanent ORASECOM structures could improve the speed and effectiveness of ORASECOM's reaction to issues raised.

ORASECOM is probably the most complex river basin organisation in Southern Africa, because it involves so many riparians, and existing, often highly elaborate bilateral schemes, without necessarily having jurisdiction over these schemes[27]. Given this complexity, an adaptable management structure is essential in order to be able to implement the Integrated Water Resource Management Plan.

[27] 2003. Turton et al. *Transboundary Rivers: Sovereignty and Development: Hydropolitical drivers in the Okavango Basin*

6 RECOMMENDATIONS FOR PHASE 2

6.1 The implications of changes to national systems

The "Legal Aspects" report has identified specific requirements (in terms of national legislative changes) for effective implementation of the IWRMP. If these are implemented, the institutional structures established by the legislation, will also change. Furthermore, given that two of the basin states' institutional and legislative frameworks are already under review, and all are considered to be in a state of transformation, an ongoing investigation of the impacts of these changes should be carried out through Phase 2.

6.2 Administrative and coordinating bodies

As mentioned, there are unconfirmed reports that the process of establishing a secretariat in ORASECOM is underway. It is essential that clear roles and responsibilities of the Secretariat are defined and supported by agreement between the parties. These should be assessed in Phase 2, and agreement between the parties facilitated accordingly.

Furthermore, the structure and functions of the coordination unit that has been suggested in this report could be investigated in Phase 2, following a clear understanding of the nature of the Secretariat. A structure such as this, would require wider participation, and therefore would need to incorporate a detailed basin-wide stakeholder identification process.

An analysis such as this should also include an investigation of the potential for similar structures in the LHWC and PWC, in order that a transparent, collaborative structure that flows both ways can be established. This could create a link between ORASECOM, the LHWC and the PWC, in order to improve the level of integration, thus improving the effectiveness of the IWRMP.

6.3 Organisational funding

If these administrative and coordination bodies were permanent within ORASECOM, they would require funding. Costs of these bodies should not necessarily be equally distributed across the basin states, but could be based on relative benefits of the use of water. In any event, the Secretariat currently being established would require funding and therefore an analysis of potential cost structures would be necessary in Phase 2. A link with an analysis of the benefits of the use of water throughout the basin could also inform the criteria for equitable allocation.

6.4 Allocation criteria

The ORASECOM agreement states that the definition of equitable use should follow that set out in the SADC Protocol. The criteria set out in the Protocol are necessarily vague, since they relate to all basins in the SADC region. Conditions are different in each basin, and, as such, it may be more practical to develop basin-specific criteria. This would improve the flexibility of the allocation criteria, as well as their adaptability in changing conditions. An investigation for the quantity and quality of allocations and the practical applicability of the criteria could take place during Phase 2. This could be linked with the study of the relative benefits of water use to allow for scenario planning for future use or development of the basin. The investigation could also include an assessment of the flexibility of the set of criteria, possibly through case studies – such as the potential development of the Lower Orange.

6.5 Information systems

One of the key principles of IRBM agreements is the sharing of information between basin states. Moreover, an essential prerequisite of effective management (especially in the context of the complexities of international waters) is an adequate information system. Phase 2 should include an assessment of the parameters of a basin-wide information management system. The assessment should include full business process analysis, levels of access, development of indicators, security and equipment. This assessment should be linked to the investigation into the roles and responsibilities of the Secretariat, since the information system would best be housed within that body.

6.6 Dispute resolution mechanisms

The legal report in this series suggests an investigation of more flexible dispute resolutions mechanisms, given that the SADC Tribunal has only recently been established and does not necessarily have the technical capacity to address the complexities inherent in issues relating to international waters. An analysis of the recommendations of this study (should it take place in Phase 2) as they relate to the institutional structure would be essential.

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