Improving Africa's Water Security

Progress in Integrated Water Resources Management in Eastern and Southern Africa

Global Water Partnership

GWP Eastern Africa and GWP Southern Africa

About the Publishers

The Global Water Partnership (GWP), established in 1996, is an international network open to all stakeholders involved in water resources management. Through its network, GWP fosters integrated water resources management (IWRM). IWRM aims at ensuring the coordinated development and management of water, land and related resources in order to maximize economic and social welfare without compromising environmental systems.

GWP Eastern Africa (GWP EnA) is one amongst 14 regional water partnerships of the Global Water Partnership (http://www.gwpena.org). It was launched in 2003 and covers 9 counties, Burundi, Eritrea, Ethiopia, Kenya, Sudan, Uganda, Rwanda, Djibouti, Somalia with Country Water Partnerships established in seven of these countries. In these countries, GWP Eastern Africa fosters Integrated Water Resources Management (IWRM) with an aim to ensure the coordinated development and management of water, land and related resources in order to maximize economic and social welfare in the East African Region.

GWP Eastern Africa provides a platform for multi-stakeholder dialogue at regional and country level to promote integrated approaches towards water resources management and use.

GWP Southern Africa was launched in 2000 as the first regional water partnership in the GWP family with a mission of promoting sustainable water resources management within countries in the SADC region. GWP SA covers 14 countries namely Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe. GWP SA works closely with SADC at the regional level through facilitating a neutral multi-stakeholder platform for dialogue and consultation.

At country level GWP SA through its 12 established Country Water Partnerships has been promoting better water resources development and management through IWRM.

Acknowledgements

This report is the main output of a joint GWP EnA and GWP SA survey on the status of IWRM Planning and Implementation in Eastern and Southern Africa carried out between September 2008 and April 2009.

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A total of 24 countries, 12 from each of the regions were covered in this survey and they include Angola, Botswana, Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Seychelles, Somalia, South Africa, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.

The following individuals of the GWP EnA and GWP SA secretariat have been instrumental in finalizing the report under the supervision of Simon Thuo, Regional Coordinator GWP Eastern Africa and Ruth Beukman, Executive Secretary, GWP Southern Africa: Jason Oyugi and Andrew Takawira (Regional Project Managers in Eastern and Southern Africa respectively), Alan Nicol and Barbara Schreiner (Lead Consultants in Eastern and Southern Africa respectively) and with input from country reports prepared by national consultants.

Intermediary results have been presented and discussed at the regional validation workshops in Eastern and Southern Africa in October 2008 in Kampala Uganda and in April 2009 in Johannesburg South Africa with additional inputs from reviews by regional experts. In Southern Africa the report was presented to the SADC Water Resources Technical Team who provided useful comments.

Foreword

Development is, first and foremost, about allowing people to lead a life they value and enabling them to realize their potential as human beings. The framework for this development is today reflected in the broad vision of the Millennium Development Goals (MDGs). We are rapidly approaching the first set of targets for the delivery of the MDGs, yet all the recent surveys still paint a sad picture – there is consensus, nine years since the 2000 Millennium Summit, that "the world has not made the necessary progress" to achieve key MDG targets by 2015 and that based "on current trends, sub Saharan Africa could miss all the MDG targets".

The special theme for the AU Summit in July 2008, in Sharm El Sheikh, was "Water and Sanitation". The summit confirmed that "there is an underutilization and uneven sharing of water resources in Africa," that not much progress has been made in Africa compared to the rest of the world in achieving the MDGs, and that, based on current trends, Africa needs to accelerate its efforts. The summit identified eight challenges that need urgent attention, including adapting to climate change and making progress on integrated management of national and transboundary surface and groundwater.

The IWRM survey in Eastern and Southern Africa has provided us with an opportunity to take this commitment further. The survey has helped us to understand where we stand in regard to planning and applying Integrated Water Resources Management (IWRM), as an approach to better water resources management. Looked at more deeply, however, this report is useful more broadly than just in the water sector. Integrated Water Resources Management is the single most important approach that will help us align water resources management with development for human needs, economic development and the protection of the environment. As importantly, it is another step in responding to the water related challenges of climate change in our regions.

As this report shows, the challenges and opportunities vary from country to country, but several themes emerge. First, we need to treat water as a political priority. Our limited budget provisions for the water sector attest to the low national priority currently accorded to water, just as much as the low emphasis by the international development community that has coalesced around the MDGs. Secondly, many of the poor in our countries still pay some of the highest prices for water – which means our tools, technology and management framework for water supply, allocation and pricing need a rethink. Thirdly, the rapid depletion of our national resources and increased water stress means the environment must form a critical element in future water management approaches. We are not running out of water. But many of our peoples live in areas subjected to mounting water stress. The symptoms of overuse are exceedingly clear and put bluntly, we are running down one of our most precious natural resources. Finally, in the face of climate change, we have seen that, unless action is taken now, the potential for the rolling back of our development is real.

The outcomes of this survey are also an important demonstration of what collaboration and partnership can achieve. In November 2007 when the African Ministerial Council on Water (AMCOW) and the Global Water Partnership formally entered into a Memorandum of Understanding to underscore the mutual benefits of our long standing collaboration, we did so with the confidence that our partners would find this relationship useful in driving the water agenda on the continent. The African Development Bank, through the Water Partnership

Programme, has taken an important lead in supporting this process and we remain forever grateful. This is a key part of GWP's contribution to the AMCOW work program to address Africa's water challenges.

The continent has faith and confidence in us, and, as we work towards achieving the Africa Water Vision, we must continue to embrace such partnerships and initiatives to face our enormous responsibilities.

This report is a product of research, analysis and extensive consultation and is intended to stimulate action, debate and dialogue around the issues that will certainly have a profound bearing on our progress as a continent towards achieving the MDGs. Let us now walk the next step.

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1. Introduction

Integrated Water Resources Management (IWRM) is a critical foundation for sustainable development and the achievement of the Millennium Development Goals and for balancing competing and increasing demands on water resources. Eastern and Southern Africa face a range of water management challenges, in a context of wide-spread poverty and under-development.

These regions are also vulnerable to considerable climate variability associated with floods and droughts, and significant potential impact from climate change. It is in this context that the Global Water Partnership Eastern and Southern Africa with support from the Multi Donor Water Partnership Program, of the African Development Bank, supported a process to review experiences on the elaboration and implementation of National IWRM planning in Southern Africa and Eastern Africa.

At the 4th World Water Forum in Mexico in 2006, many countries reported progress against the IWRM target in a GWP 'informal' survey—Setting the Stage for Change (GWP, 2006). The survey noted that of eight countries surveyed in Eastern Africa, only one country had 'plans or strategies in place, or a process well underway, and that incorporate the main elements of an IWRM approach'. Four countries, it noted, were 'in the process of preparing national strategies or plans but require further work to live up to the requirements of an IWRM approach'. Three countries had 'taken only initial steps in the process towards preparing national strategies or plans and have not yet fully embraced the requirements of an IWRM approach'.

While there has been progress in the two regions, implementation and progress is generally slow, and there are a number of areas in which substantial improvement is needed.

The same report noted that, in Southern Africa, three countries had 'plans or strategies in place, or a process well underway, and that incorporate the main elements of an IWRM approach', five countries were 'in the process of preparing national strategies or plans but require further work to live up to the requirements of an IWRM approach', while two countries had 'taken only initial steps in the process towards preparing national strategies or plans and have not yet fully embraced the requirements of an IWRM approach'.

In the UN-Water Survey for IWRM (UN-Water, 2008), out eight of the twelve countries in Eastern Africa covered in the recent survey, one had an IWRM plan in place, three had plans in preparation, and four were on the level of "only initial steps taken". In the same study, of 10 countries in Southern Africa, 3 had IWRM plans in place, 6 had plans in preparation and one was on the level of 'only initial steps taken'. Superficially at least, there appears to have been little progress made between the two surveys. The latest survey, as reported here, shows greater improvement, with only one country in the two regions showing little or no achievements in relation to IWRM planning, while 9 countries show significant achievements in this regard. However, the different indicators and methodologies used in the various studies mean that caution should be observed in interpreting the results. The current survey, as summarized in this report, reflects more broadly on the implementation of IWRM, focusing not only on the status of IWRM planning, but on a range of other indicators. These indicators, taken together, give a more nuanced assessment of the state of IWRM planning and implementation in the 24 countries under review.

Ensuring sustainable financial resources and sufficient skilled people for IWRM implementation remain two of the biggest challenges in these two regions, and lack of these is one of the reasons for the slow translation of policy into change on the ground.

As a result, the approach must be to align IWRM plans to existing capacity, to prioritise actions according to capacity, and to implement IWRM in a phased approach, according to the needs and capacity of the specific country or basin. As capacity and financial resources grow, so too can the scope of the IWRM activities grow.

Integrated, inter-sectoral planning is also a challenge in many countries, particularly integration with the planning processes of other national departments. Some interesting achievements have been made in this regard, though, as in Zambia where the Fifth National Development Plan reflects a vision for water resources management for the country.

In a number of countries the legislative platform for IWRM has not yet been finalized, yet some of these countries are managing to implement aspects of IWRM despite the absence of appropriate legislation. This is a clear indication that there is no easy blueprint for IWRM, and that the appropriate interpretation of IWRM depends on the local context. What is a priority in one country is not a priority in another.

Once a basic monitoring platform is in place and functional, the monitoring programme can be expanded to include monitoring of the implementation of IWRM and, ultimately, monitoring of the impact of IWRM.

While most of the countries report having appropriate institutional arrangements well underway, these need to be finalized and properly resourced. There is a regional recognition of the need to create a minimum institutional and infrastructure platform in water to support economic growth and social development.

In this regard, financing of both institutions and infrastructure remains a major challenge, and a priority area for further work. It is important to also note the financing of water resources management this should not be overlooked. Effective water allocation and authorization, improved water use efficiency, and environmental sustainability are also areas where considerable work is needed.

In summary, the current survey shows that while there has been progress across both Southern and Eastern Africa, it is not sufficient to meet the substantial challenges now facing the regions. Although there is recognition of the major challenges in managing water resources more effectively, particularly in the face of climate change, more must be done to actually implement IWRM on the ground. It is also clear that, while the latest studies give some indication of the status of implementation of IWRM, they do not reveal the impact of IWRM on the ground – this is a critical area that requires examination to understand whether IWRM is providing the benefits that it is presumed to do, and how implementation should be improved or refocused to improve the benefits of IWRM, particularly to the poor and the marginalized.

Progress among countries is varied, and in each country there are different constraints to and opportunities for action. Country level progress and challenges are captured in the country summaries in the last part of this report.

Inadequate data and information on the state of water resources, and of water use (abstraction and discharge) are widely cited across the region, with negative impacts on the ability of water managers to make informed decisions and to manage adaptiavely.

2. From Principles to Practice

Africa stands at a defining moment in water management, as population increase, economic growth and global climate change conspire to place major challenges on already stretched water resources management capacity. Integrated Water Resources Management has been widely recognized as the solution to this challenge, and yet IWRM itself has faced major challenges, particularly in moving from the realm of policy to actual change on the ground.

In 2002, the World Summit on Sustainable Development set an ambitious target that all countries should have an Integrated Water Resources Management Plan in place by 2005. By 2005, however, little had been achieved in this regard in sub-Saharan Africa. The African Development Bank and the Global Water Partnership commissioned, in 2008 in Eastern Africa and in 2009 in Southern Africa, a study of recent progress in the implementation of IWRM. Results from those two studies have been brought together in this report, which shows that, while progress, has been made, there are still a number of challenges to be overcome.

The importance of IWRM planning lies not in meeting the WSSD target but in the alignment of integrated water planning with economic and social development planning so that water provides an enabling matrix for social and economic development

In the past 15 to 20 years, sub-Saharan Africa has witnessed crippling droughts, destructive floods, and an apparent increase in the number of extreme weather events. This comes on top of major demographic change including population growth, urbanization, and conflict-related movement of people. Policy makers and resource planners now face a daunting challenge – to manage water in order to achieve pro-poor development outcomes in a highly unstable environment. It is precisely this challenge that IWRM aspires to meet – but what progress has been made in this regard?

Measuring achievements in IWRM implementation in the Eastern and Southern African regions is a difficult task because of lack of monitoring, the use of different indicators, and, in many cases, the paucity of reliable information. The assessment is also complicated by the wide range of physical,

climatic, social and economic contexts across the region. If IWRM is to respond to specific challenges in specific basins or countries, the priorities for action cannot be expected to be the same across a region. Nonetheless, there are some key indicators that can be used to assess the state of IWRM implementation generically. The indicators used in this report are largely based on those developed by the Global Water Partnership under the categories Enabling Environment, Institutional Arrangements and Management Instruments. In this report, the first two have been combined into one category, looking jointly at the prerequisites for an enabling environment and the institutional requirements for IWRM. A second category is that of instruments for IWRM implementation. Progress in these two areas is analyzed below.

In Southern Africa, an assessment framework was developed in consultation with national consultants from each of the twelve countries under review and national government officials. The country consultants completed an assessment of IWRM implementation according to the assessment framework. The country reports were then analyzed and synthesized into a comprehensive review of the region by a regional team of consultants. The review was presented to a workshop of country consultants and government representatives for the 12 countries in the study for validation

This process resulted in the generation of two final reports, IWRM Southern Africa: Lessons and Opportunities, and the IWRM Regional Assessment Report: Southern Africa.

Led by GWP EnA, the survey for Eastern Africa was launched in August 2008 in Bujumbura, Burundi. At a workshop for national consultants from the countries and a regional consultant, in depth discussions and consensus led to the design of the study including the creation of a toolkit based on earlier surveys conducted by GWP in 2006 and UN-Water in 2007. This toolkit covered regional contextual issues, IWRM developments, significant barriers and constraints to progress and potential ways forward. National consultants used the toolkit as a basis for key informant interviews in their respective countries and literature review, the results of which were compiled in their respective national reports.

These reports formed the basis for the Status Report on Implementation of IWRM/WE Plans in Eastern Africa - Beyond Principles: Making IWRM Progress a Reality. Preliminary results were discussed at a regional meeting in Kampala Uganda in October and contributed to the revision and finalisation of the report.

The integrated management of water in Eastern and Southern Africa is critical to the achievement of sustainable social and economic development. The challenges of climate change will exacerbate already significant water management challenges across the region.

Water managers will have to make increasingly difficult decisions on water allocation, protection, and development, decisions that are influenced by very different physical, social and economic contexts. There is no simple way to reach these decisions. IWRM, however, allows a more informed approach to making these decisions, an approach that is informed by an understanding of the linkages between water and social and economic development, an approach that is informed by the specific context in which the decision must be made.

The involvement of stakeholders is also an important element in the making of complex decisions since it brings to the decision-making process a wider and deeper understanding of the multiple linkages between water, society and the environment than can be grasped by the authorities alone.

Finally, in the face of climate change, IWRM offers an integrated understanding of the catchment, as well as adaptive management capabilities that allow water managers to make decisions in the face of increasing uncertainty.

There is no doubt, therefore, that IWRM is a valuable mode of operation in the water and development sectors. Equally, however, it is clear that IWRM is not a blue-print, but rather an approach that must be adapted to the specific needs, priorities and capacity of each country.

Stakeholder involvement is also widely recognized as ensuring better buy-in from stakeholders in the implementation of IWRM.

3. Policy, Laws and Institutional Arrangements

For IWRM to be adopted as the mode of water resources management in any particular country, an enabling environment must be in place. According to the GWP toolbox, this enabling environment sets out the rules of the game through policy, legislation, and financing arrangements. A further critical element of the enabling environment is the creation of a sufficiently developed infrastructure platform. In the context of the African continent, which is subject to high levels of climate and seasonal variability, the capacity to store and transport water is necessary to ensure sufficient assurance of supply to enable sustainable economic and social development. Since water infrastructure is underdeveloped in most parts of Africa, this forms a critical part of the enabling environment. Put simply, the best policy and legislation cannot help bridge droughts or manage floods, without the necessary infrastructure being in place.

The GWP toolbox defines, as the second category of IWRM tools, the institutional roles of resource managers, service providers, water management agencies, utilities, river basin authorities, regulators and other water sector stakeholders.

Table 1: Progress on Enabling Environment and Institutional Arrangements

Little progress achieved | Some progress, but limited achievements | Substantial achievements or progress

Country	Policy and Legislation	Infrastructure Platform	Sustainable Financing	Institutional Arrangements	Institutional Capacity
Angola					
Botswana					
Burundi					
Comoros					
Djibouti					
Eritrea					
Ethiopia					
Kenya					
Lesotho					
Madagascar					
Malawi					
Mauritius					
Mozambique					
Namibia					
Rwanda					
Seychelles					
Somalia					
South Africa					
Sudan					
Swaziland					
Tanzania					
Uganda					
Zambia					
Zimbabwe					

Table 1 provides a dashboard of progress in IWRM in the two regions.

Capacity building supports the functions required for these roles. In this report, an assessment of the effectiveness of the institutional arrangements has been combined with the enabling environment (policy and legislation, financing and infrastructure). Progress on the use of IWRM Management Instruments, is analysed separately under the following section.

The five aspects of IWRM implementation highlighted in this table cover the follow areas:

- Policy and legislation - are appropriate policy and legislation in place to support IWRM?
- Infrastructure platform – is an adequate water resources infrastructure platform in place?
- Sustainable financing – is there sufficient, sustainable financing for the implementation of IWRM?
- Institutional arrangements – are the institutional arrangements in the country appropriate for the implementation of IWRM?
- Institutional capacity – is the institutional capacity, particularly in relation to human resource capacity, sufficient to implement IWRM?

It is important not to read this table as a comparison of one country against another, since the needs, capacity and IWRM priorities of each country are very different. The table rather provides a broad level overview of progress in each country against the five indicators.

Clearly, policy and legislation reform is the area in which there has been greatest progress in the establishment of an enabling environment for IWRM, although there are still several countries in which little or no progress has been made, such as the Comoros where a law exists but not a policy and Somalia that lacks both. Almost half of the countries show significant progress in putting in place appropriate policy and legislation.

This can be seen as a response to the global IWRM discourse over the past decade which has stressed policy and legislative reform as a critical starting point for the implementation of IWRM.

Unfortunately, institutional capacity, sustainable financing, and infrastructure development reflect lower achievements, revealing some constraints to the ability to actually implement IWRM. For a fully enabling environment to be in place, these three areas need considerable attention.

Considerable progress has been made in the establishment of appropriate institutional arrangements for IWRM.

Most countries have identified one, clear, apex Ministry responsible for IWRM, and most have separated responsibility for water resources management and services provision functions.

Equally, in most countries the principle of decentralization of water resources management and the management of water according to hydrological boundaries has been accepted.

However, the establishment of appropriate institutional arrangements has not progressed equally across the region. While some countries, such as Zimbabwe, Tanzania, Kenya and Ethiopia have established catchment level institutions, in other countries establishment has taken longer than expected.

In some countries the institutions are in place, but lack the necessary

Generally across the two regions, there is strong support for the shared management of transboundary basins, shown not only in national policy and legislation, but also in the number of transboundary agreements and institutions that have been established.

skilled personnel and financial resources to operate effectively.

In Botswana, interestingly, because of the topography and the reliance on groundwater in large areas of the country, water management according to hydrological boundaries was considered and rejected as not being appropriate.

The institutional and technical capacity to manage groundwater remains an area where considerable improvement is required across both regions.

Capacity building, of institutions and technical capacity remains, therefore, an ongoing priority in all countries. Institutional capacity development programmes must be enhanced to enable transboundary and national institutions to cope with current and future water management demands. Part of this is the enhancement of the skills of frontline water managers and practitioners at regional, country and local government level, and the forging of both South-South and North-South partnerships to foster information, experience, knowledge and technological exchange. Regional dialogue and networking and greater investment in the scientific capacities of institutions charged with information and knowledge generation will also foster improved water management in the region.

Beyond lack of capacity, the greatest institutional challenge is ensuring effective engagement with other organs of state outside the water sector. While progress is reported in many countries, the same countries report that collaboration and co-ordination still need to be improved. Even within line ministries responsible for water, transverse work approaches that cut across departments need strengthening. In many countries in the two regions, the inability of water ministries to integrate planning and implementation weakens their abilities to reach out across other non water sectors.

Lesson No. 1: A means, not an end

There is no single blueprint for the implementation of IWRM, IWRM is not an end in itself, but a means to an end, the end being the environmentally sustainable management of water resources in a manner that supports the social and economic development of a basin, country or region. The most effective IWRM planning is that which finds the simplest means to achieve this end.

4 Management Instruments

The translation of IWRM policy and legislation into implementation on the ground is a lengthy and challenging process. To assist implementation, the Global Water Partnership highlights several management instruments that can be adopted, such as water resources assessment, water demand management, public information and education, conflict resolution, regulatory devices, economic measures and information and communications.

As can be seen in table 2, slower progress has been made in the implementation of the management instruments than in the development of the policy and legislation. This is to be expected, since the implementation of IWRM begins with policy and legislative reform, and progresses to the implementation instruments. It does, however, suggest that there is still a long way to go in both Eastern and Southern Africa to successfully implement the full suite of tools that make up IWRM. There are also some troubling signs that suggest that some of the fundamentals of sound water resources management are not in place in many countries, such as monitoring of the state of the water resources and sufficient financial resources and human capacity to implement plans and programmes.

The greatest progress has been in the areas of IWRM planning and stakeholder engagement. The focus on IWRM planning has, no doubt, been significantly driven by the WSSD IWRM/WE target, along with the emphasis placed on IWRM planning by the GWP country water partnerships (CWPs).

In several countries, IWRM planning was initiated or stimulated by the activities of the CWP. Similarly, the CWPs have played a significant role in many countries in promoting stakeholder engagement, and providing a platform for such engagement to take place. The CWPs have, in many countries, not only brought stakeholders

together, but have served as a link between stakeholders and government, and strong relationships between the CWPs and government have developed in a number of countries.

The low level of achievements in monitoring and information is a concern, since sufficient data and information, derived from monitoring of water resources (quality and quantity) are critical for effective water resources management, particularly in the context of high climatic variability.

Ideally, countries should be monitoring not only the state of water resources and water use, but also the implementation of IWRM and, ultimately, the impact of IWRM. The latter two, however, are dependent on the first, which remains an area in which a great deal of improvement is still needed.

Although both South Africa and Zimbabwe record significant achievements in the area of monitoring and information, monitoring in these two countries is on a downward trend due to poor maintenance of monitoring structures and poor human resource capacity. This trend, prevalent in other countries as well, reveals an important lesson - that the gains made in implementing IWRM should never be taken for granted.

Even in countries such as South Africa, where effective legislation and methodologies for protection of aquatic ecosystems exist, implementation has been limited

While progress has been made in the area of environmental sustainability, through measures such as the implementation of environmental impact assessments on water

resources projects, and the awareness of the ecological needs for water, no country reports significant achievements in this regard.

The need for appropriate methodologies for determining environmental water requirements suitable to specific country contexts, and particularly in relation to ephemeral rivers, was cited by some

participants as one element currently hindering the implementation of environmental water requirements.

The high number of countries that show no significant achievements (8 countries are still in the red) in the area of water demand management and unconventional water sources reveals the slow progression being made from supply side management to demand side management.

While a handful of countries have made significant progress in this regard, there is still a great deal of work to be done in this area across both regions. In some countries, the lack of progress is the result of high per capita water availability, but in many countries is it a reflection of poor infrastructure management and a focus on other priorities. A lack of effective pricing tools was noted in some cases and, where they existed, there was a lack of capacity to enforce compliance.

Critical areas mentioned by a number of countries included the lack of sufficient, or poorly coordinated, knowledge and information management on which to build more effective instruments.

Table 2: Progress on the implementation of management instruments for IWRM

little progress achieved | some progress, but limited achievements | substantial achievements or progress

Country	IWRM Planning	Water use efficiency	Stakeholder engagement	Allocation mechanisms	Monitoring & information	Environmental sustainability
Angola						
Botswana						
Burundi						
Comoros						
Djibouti						
Eritrea						
Ethiopia						
Kenya						
Lesotho						
Madagascar						
Malawi						
Mauritius						
Mozambique						
Namibia						
Rwanda						
Seychelles						
Somalia						
South Africa						
Sudan						
Swaziland						
Tanzania						
Uganda						
Zambia						
Zimbabwe						

In some cases this was linked to low in-country capacity to train and build staff skills, in others, the relatively low information management and exchange that takes place at a national level.

In several countries there were problems of conflict over access to water resources, the impact of changing land use on availability and other factors generating or exacerbating resource management tensions.

The management instruments to help address these tensions and conflicts were not always apparent.

While political will was sometimes cited as the reason behind poor implementation of some instruments, particularly charging for water, lack of financial resources and poor human capacity remain the single biggest challenge to the implementation of IWRM in Eastern and Southern Africa.

Lesson No. 2: No blue print for IWRM

There is no single blueprint for the implementation of IWRM, and effective IWRM is premised on the identification of the key elements appropriate to a particular country or basin context. In developing an IWRM plan, it is important to identify particular challenges pertaining in a basin/country, and the key actions to address those challenges.

5. Actions to Accelerate IWRM Planning and Implementation

The regional workshops identified a number of opportunities to further implement IWRM in both Eastern and Southern Africa, which have been clustered into several priority areas for action:

- The Regional Economic Communities and other regional players should drive a programme of **Strategic Dialogues** in all countries, to encourage engagement between the water sectors and other key economic and development sectors. This should be carried forward at the national level to ensure a gradual shifting of IWRM thinking from the water sector to the broader economic development sector.
- The Country Water Partnerships and water departments should continue to drive targeted **awareness raising** programmes and to engage with representatives of key government departments, to ensure that the understanding of the importance of IWRM to sustainable social and economic development is widely understood and that water resources issues are integrated into relevant planning processes.
- IWRM plans should reflect the key **national water management priorities** of the respective countries and should be aligned to capacity constraints and opportunities.
- It is critical that countries finalise and implement their **institutional arrangements** as soon as possible. Long delays in setting up institutions paralyses the delivery of IWRM, so it is better to effectively implement a good enough institutional arrangement than to delay the process in search of the perfect arrangement.
- IWRM plans should elucidate the mechanisms to be employed to **build capacity for implementation**, drawing on existing training and capacity building programs, and identifying gaps where appropriate. The capacity to be built should be focused on the implementation of the identified priorities first.
- The RECs, RWPs, AMCOW and other stakeholders should refine appropriate indicators for the **monitoring of IWRM** implementation and the impact of IWRM at national, transboundary and regional level, to support countries and basin organizations in the ongoing strategic dialogue on the implementation of IWRM in the region.
- There is need to deepen debate on the current **challenges in accessing financing** in both regions and make recommendations on how external financing opportunities could be better tailored to meet the needs of the countries. It is important for financing to become government- rather than donor-led to ensure greater long-term sustainability.
- Development of briefing documents that take a look at the challenges of financing of water resources development and management in the region and providing guidance on appropriate financing options at project and country level.
- All countries should ensure that IWRM plans include water resources infrastructure requirements, taking into account requirements to adapt to climate change, and for flood and drought management, while GWP needs to engage infrastructure development as a key part of IWRM planning.
- Countries must adapt their IWRM planning and implementation to meet the challenges of climate change and variability. Because IWRM promotes the holistic approach to water resources management and recognises that there are multiple pathways to building resilience, it provides the best framework within which to respond with a judicious mix of both hard(investment on infrastructure) strategies and soft (institutional and management) strategies. Most countries do not look at climate change this way.

6. The Role of Regional Platforms and Institutions

The GWP regional partnerships have been a key facilitator of regional IWRM processes in the southern and eastern African regions. In southern Africa, for example, the GWP was a key player in driving the development of an inter-sectoral developmental vision for water, through dialogues in every SADC member state at national level. This culminated in a regional vision which informed the Africa vision on water and led to the Southern African Framework for Action, also led by GWPSA.

The Framework for Action was based on national and regional cross-sectoral dialogues and the development of national Frameworks for Action, and informed the SADC regional water policy and strategy processes.

In Eastern Africa, the Regional Water Partnership has played a central role in providing a platform for dialogue and consensus building around the water agenda in the sub-region. New impetus has now been provided in the collaboration of GWP and the African Ministerial Council on Water (AMCOW) following the sustained leadership and engagement between GWP Eastern Africa and the pan African policy making processes. The partnership with AMCOW, especially in Eastern Africa, has served as a catalyst for deepening interaction at the continental level with the identification of long term areas of engagement including assisting AMCOW through the provision and access to technical IWRM information, supporting AMCOW with multi-stakeholder participation through the regional and country water partnerships, and joint resources mobilization for the water sector.

At the regional level, GWP EnA has provided leadership in dialogue, awareness raising and policy advice on financing water, climate change, capacity building and engagement with the media. The Nairobi meeting on Financing Water for example, produced a sub-regional compact for action by unpacking the challenges to investment and implementation of water projects in the region. It also provided a forum for discussing and influencing Sector Wide Approaches, budget absorption and donor hurdles in supporting water sector in the region. And at the sidelines of the commonwealth heads of state meeting, the Jinja Declaration sought action from the Commonwealth Heads of Government address the challenges of climate change in the Commonwealth.

There is an ongoing need for the GWP Regional and Country Water Partnerships to continue to play a similar role and to build on the successes of the past. The key areas for action by GWP include policy and legislation, cross-sectoral engagement and dialogues, and capacity development including knowledge sharing. The packaging of information (scientific) and knowledge, and communicating the lessons of IWRM are also a priority area where GWP can work with academic institutions to bridge the science, policy and application gaps.

At the national level, the country water partnerships have played an important role in raising awareness around IWRM, bringing together government departments and stakeholders outside of government and driving, with government, IWRM planning processes. This role should be strengthened, and CWPs should be encouraged to assist in identifying areas for improvement in consultation and co-ordination, and to assist in raising IWRM on the national agenda through lobbying and awareness raising.

The CWPs should continue to broaden their membership and engagement to achieve the widest possible involvement in IWRM processes at the national and

GWP has also been very active in promoting dialogues between sectors, similar in nature to the proposed dialogues outlined in the previous section. This is a role that should be further enhanced and taken forward.

basin level. In those countries where legislation has not yet been finalized, the CWPs have a critical role to play in supporting the water departments to push for finalization of the legislation. CWPs

can also play a useful role in supporting transboundary initiatives around stakeholder engagement, cross-sectoral engagement and promoting understanding of the benefits of IWRM in national and international basins. They could also assist in aligning national and basin level IWRM plans.

The CWPs and RWPs, and their membership of local, provincial, national and regional institutions and strategic partners, offer opportunities for vertical integration and linkages towards sustainable development.

Lesson No. 4: Aligning plans and capacity

In a region with limited financial and human capacity in the water sector, the alignment of IWRM plans with available resources becomes critical, so that plans and targets are realistic and achievable. At the same time, however, programmes to continue to build capacity and strengthen water management institutions must continue, focusing on both financial capacity and human resource capacity.

7. Eastern Africa: Country Overviews

Eastern Africa is relatively well endowed with freshwater, with total average renewable freshwater resources of around 190 km^3/yr. however, rainfall varies widely across the region, with annual averages ranging from over 2,300mm per annum in Seychelles, over 1000 mm per annum in Uganda, Burundi and Rwanda, to around 150 mm per annum in Djibouti (FAOSTAT 2000). Rainfall also varies widely across seasons, with a high percentage of rainfall often falling over three to four months, and inter-annually, with floods and droughts frequent across the region.

Droughts are particularly prevalent in the drier countries in the Horn of Africa (Ethiopia, Eritrea and Somalia). These inter- and intra-annual variations determine water availability.

Surface water dominates freshwater resources in eastern Africa. Lake Victoria, which provides was to Uganda, Kenya and Tanzania, and, through the Nile, to Sudan and Egypt, is the second largest lake in the world. The total area of the Nile basin represents 10.3% of the area of the African continent and spreads over ten countries. For some countries, such as Kenya and Tanzania, the Nile basin forms less than 10% of their territory. In other countries such as Burundi, Rwanda, Uganda and Sudan are almost completely integrated into the Nile basin.' However, all the waters in Burundi and Rwanda and more than half the waters in Uganda are produced internally, while most of the water resources of Sudan and Egypt originate outside their borders: 77% of Sudan's and more than 97% of Egypt's water resources at the downstream end of the Nile River.

Other major freshwater lakes in eastern Africa include Lake Tanganyika in Tanzania; the Ugandan Lakes Edward, George, Kyoga and Albert; eleven lakes in Ethiopia, and Lake Turkana in Kenya.

Population growth and economic development are increasing demand for freshwater in the region, as is increasing per capita use in the domestic sector. At the same time, more land is being cultivated and irrigated in order to improve food security. These shifts are posing huge challenges to both water resources management and water services. Groundwater aquifers are being mined, and wetlands are used as a source of water for humans and livestock, and as farming and grazing land.

Water resources are threatened by pollution from domestic, agricultural and industrial sources. Poorly serviced and managed settlements result in the discharge of untreated sewage directly into watercourses. Poor agricultural practices contribute to the pollution of freshwater sources through increasing use of agrochemicals and through unsustainable farming practices and overgrazing which increase soil erosion. Increased sediment loads in rivers, increase siltation in dams and lakes, smothering habitats, flora and fauna.

To exacerbate the current challenges, the IPCC predicts a decrease in rainfall in the already arid areas of the Horn of Africa, with increases in drought and desertification.

BURUNDI

Population (million)	7.859
Life Expectancy at Birth	48.5
GDP per Capita (US$)	699
Water Availability per Capita (m^3/a)	1 534

Introduction

Burundi is a landlocked country close to the equator, astride Central and Eastern Africa, sharing borders with Rwanda in the north, the United Republic of Tanzania to the east and south, and the Democratic Republic of Congo on the western side where Lake Tanganyika lies. It has a surface area of 27 834 km^2, of which 2 634 km^2 are occupied by surface waters.

Nearly half of the population of 7 million (2004) is under 15 years of age. The population density, one of the highest in Africa, is about 254 inhabitants per km^2 with areas of to 400 – 500 per km^2.

Three ministries are responsible for managing natural resources and the environment in Burundi: The Ministry of Agriculture and Livestock, the Ministry of Water, Energy and Mines, and the Ministry of Local Government and the Environment. A national Water Commission has been created as an inter-ministerial body concerned with water management, under the guidance of the Ministry of Water, Energy and Mines.

New focus on IWRM

In December 2005, Burundi established a Steering Committee to guide a new Country Water Partnership (CWP-Burundi). This committee began elaborating a Statute to govern the functioning of the CWP-Burundi and a project to renew interest in financing the sector.

Funds were obtained from the AfDB in 2006 to facilitate the development of an Action Plan for IWRM. The process of preparing the IWRM Plan was launched on the 14th November 2007 by the Minister responsible for Water and Environment, in the presence of numerous stakeholders, including donors.

A Programme of Activities for 2008-2009 is being followed by the National Technical Water Committee (NTWC). A situational analysis has been prepared which deals with the problems, challenges, constraints and opportunities, institutional roles and functions and strategies for communication within the water sector.

State of IWRM Processes

In 1992, the government passed a law on the organization of the water sector, following which it produced a National Water Master Plan in 1993. Widespread conflict, however, prevented the implementation of these documents.

Burundi is now, however, focusing on pressing issues of policy development, including how to manage its natural resource endowments most effectively. In 2001, the Government completed the development of a National Water Policy. This was an important initial step, but unfortunately it still is awaiting Parliamentary approval.

Further concerns are that once approved, the policy may suffer from a lack of suitable institutions capable of implementation and of enforcing compliance. Institutions charged with water management face major resource challenges both internally and externally. Some of the challenges derive from pressure on natural resources caused by one of the highest population densities in Africa, one consequence of which is increasing cultivation on grazing lands, exacerbating land degradation and prompting conflicts with other land users.

In November 2007, the country finally designated a Minister in charge of water resources, after prompting by civil society. Major challenges now include finalizing the water policy in the face of growing resource management challenges.

Key Opportunities and Challenges:

There are a number of resource management challenges facing the country, including serious deforestation, soil erosion and sedimentation of water sources. Management of these challenges is made more difficult by non-enforcement of the national water law and policy, lack of harmonisation of national regulations, overlapping responsibilities between institutions, poor infrastructure, no national data management structure, no specialised training institutions, and weak co-ordination of funding for the water sector. There is also a lack of attention to transboundary aspects within sector policies and documents.

COMOROS

Population (million)	0.798
Life Expectancy at Birth	64.1
GDP per Capita (US$)	1 993
Water Availability per Capita (m^3/a)	1 466

Introduction

The Comoros are an archipelago of three volcanic islands between Madagascar and Mozambique (a fourth island, Mayotte, remains a part of France). With a population of some 790,000, water supply for domestic consumption is a major challenge with current supplies insufficient for the needs of the growing population.

The Comoros currently have a water management strategy under preparation by the Ministry of Energy, Industry, Mines and Water. In recent years policy in the **sector** has been guided by the National Environmental Action Plan of 1994. The French aid agency, AFD, is supporting the government in the development of an integrated water management plan (SDN).

State of IWRM Processes

Policy is guided at a central level by the Ministry of Energy, Industry, Mines and Water. Responsibility for implementation of policy is vested in the National Directorate for Energy, Resources and Water (DNERE), which controls exploitation of the resource and collaboration with external organizations in resource development.

Each of the three islands also has a minister responsible for water under subdivisions of the DNERE. A public company manages supply distribution for water and electricity (MAMWE—Madji na Mwendje ya Komori), in the capital, Moroni.

The environmental law of 1992 includes a water code, which defines the nature of the resource base and how to protect and manage the resource. Under the code the resource is property of the State, which reserves the right to exploit water the public good. However, currently there is a lack of human and institutional capacity to enforce the code.

Key Opportunities and Challenges

The Comoros are particularly vulnerable to climate change, with major concerns over the impact of sea level rise and precipitation patterns on water supply availability and quality.

Central challenges of water management include the capture, storage and delivery of water resulting from the hydro-geological conditions across much of the volcanic archipelago, to the poorly-developed institutional, infrastructure and policy environments.

Other challenges include lack of institutional coordination and effective planning processes, a shortage of technical capacity, lack of state investment since the 1980s, poor system maintenance, and poor water quality.

Localized management

Only Moroni (the capital) has a public company providing water, with limited cost recovery and application of tariffs. Elsewhere there is no charging for water and little institutionalised development of supplies.

In 2002, the Union of Water Committees of Ndvouani (UCEA) was created under the Projet d'Appui à la Gestion de l'Eau aux Comores (PAGEC). This was financed by AFD and implemented by the NGO 'Initiative Développement (ID).

This initiative provides an administration and council that represents the water committees within respective island communities.

The UCEA role is to assist in developing suitable management structures for committees in each locality. Similar unions exist on each of the three islands, though some are less official in nature.

DJIBOUTI

Population (million)	0.804
Life Expectancy at Birth	53.9
GDP per Capita (US$)	2 178
Water Availability per Capita (m^3/a)	367

Introduction

The Republic of Djibouti lies on the coast of the Horn of Africa, bordered by Ethiopia, Eritrea and Somalia. The country covers 23,000 square kilometres.

Two-thirds of the population live in Djibouti city itself where most of the country's economic activity is based — in particular, its service industry, centred around growing cargo handling and ports facilities. With an active volcanic geomorphology and an arid climate with less than 150mm of rainfall a year, the country relies on groundwater for 95% of its supplies.

State of IWRM Processes

Water resources management in Djibouti is governed by a Water Code, supervised by a National Committee on Water Resources which helps to ensure cross-sectoral and inter-sectoral coordination. However, the growing population and very small resource base mean that future management faces a daunting need to produce 'more water' annually. Much of the management challenge in Djibouti focuses on this issue.

A National Committee on Water Resources (CNRE) was created in 1989 as the principal coordination body in the sector, but requires revamping in the light of new reforms in the sector. The CNRE is chaired by the Minister for Agriculture and brings together principal ministries and technical departments. CNRE also acts as a 'think tank' for the sector and includes NGO representation. It was responsible for developing the management framework (SDE) in 2000.

The management framework elaborated in 2000 lays down key water policies and plans which promote (1) rational management of water resources, with particular attention to current and future needs; (2) increasing the availability of water and maintaining quality as well as accessibility for poor populations; (3) reinforcing the institutional framework of water management to improve performance of sector institutions; and (4) bringing greater stakeholder engagement into programme choice and water management.

At the governmental level, the Ministry of Agriculture, Maritime and Water Resources (MAEMH), has overall authority in water resources management. The National office of Water and Sewerage of Djibouti (ONEAD) is a publicly-owned establishment providing drinking water and sewerage in urban areas. In recent years, development of infrastructure, in particular to augment surface storage, has become a priority.

Legislation and Financing

In 1996 Djibouti developed a new Water Code. The government is currently updating the Code, which will be followed by a decree applying the new Code. This aims to improve general understanding of the provisions and to overcome earlier limitations in human and technical within institutions.

In addition, in 2001, the government established the National Fund for Water (FNE) to address the particular concerns and priorities of the National Committee on Water Resources. These include maintenance of rural water points, more research on the resource base, emergency interventions, developing greater social assessment to improve sustainable access to drinking water for the poor, and financing actions that improve the management of water resources in the short to long-term.

In addition, the government has created the Djibouti Agency for Social Development (ADDS) which now plays a significant part in the water sector through direct investment and the provision of micro-credit to communities.

Key Opportunities and Challenges

By 2015, Djibouti will have to almost double its production of drinking water to meet current demand projections—this means in reality an increase of more than 2 million m3 per year on current production levels.

Other challenges that need to be managed include flash flooding and erosion in rural areas, siltation of dams, lowering of the water table due to over-abstraction, and insufficient water infrastructure development. There are also major groundwater challenges relating to pollution, salt water intrusion, and environmental degradation around water points in rural areas.

ERITREA

Population (million)	4.527
Life Expectancy at Birth	56.6
GDP per Capita (US$)	1 109
Water Availability per Capita (m^3/a)	1 343
Dam capacity (km^3)	0.094

Introduction

Though small, Eritrea has a complex topography and major resource management challenges. The population is heavily rural (80%) spread across five major river basin systems. Most water provision for the human population is from the country's groundwater resources.

State of IWRM processes

The Ministry of Land, Water and Environment is mandated to form policy regulations and provide technical support to resource development in Eritrea. Separate regional administrations are then tasked with following up on implementation.

The National Environmental Management Plan (1995) identifies key priorities including preparation of a water law, promotion of water conservation measures, comprehensive water resources assessment of groundwater, and the protection of water resources from pollution. It also highlights the need for intensive training and raising of public awareness, development of appropriate pricing policies and promotion of cooperation in the environmentally sound exploration of transboundary rivers.

The government has reviewed and redrafted the water resources policy, and drafted a proclamation for the establishment of new water resources authority/commission to improve the enabling environment for IWRM. Draft policy and legal frameworks have been linked with other national development strategies, sectoral policies and management plans. A Country Water Partnership (CWP) was established in 2005 and has contributed to the promotion of IWRM in the country.

A strategy document set the out a vision, goals and directions, leading to the December 2007 preparation of an IWRM action plan. Eritrea now has a revised and updated 2004 Water resources policy, and revised and updated water laws of 1997 and 2004. A new institutional framework has been outlined with clearly-defined management roles, responsibilities and functions for the proposed Water Authority/Commission.

Key Opportunities and Challenges

The key challenges and opportunities in the country include the lack of sustainable financing for implementing IWRM plans, exacerbated by limited human resources. Climate variability and low investment in water storage and infrastructure are exacerbating water scarcity. This situation is compounded by poor water allocation and inadequate resource assessment.

A neutral multi-stakeholder platform

Eritrean water stakeholders began the process of meeting the WSSD IWRM/WE target by the formation of a Country Water Partnership (CWP). Using the CWP as a platform for consensus building and dialogue, they continued the IWRM process by conducting meetings, briefings and workshops to secure political will and consolidate stakeholder involvement in the preparation of the IWRM plan.

With support from the government, and commitment from partners and stakeholders, a water sector situation analysis report was drafted in 2006. This defined the nation's water resources and elaborated on progress, and on the outstanding water management and development issues, challenges, problems and possible solutions. In 2007, a strategy on how to address the identified gaps for IWRM was formulated and documented with the participation of stakeholders. In 2007-8, an IWRM Action Plan was prepared, which is presently under review by the Ministry of Land, Water and Environment, technical and core members of the CWP and key stakeholders.

In order to respond to the urgent challenges in water resources management, development and use, Eritrea has reviewed and redrafted their water resources policy and water resources proclamation, and has drafted a proclamation for the establishment of a new water resources authority/commission that will improve the enabling environment for IWRM.

ETHIOPIA

Population (million)	78.986
Life Expectancy at Birth	51.8
GDP per Capita (US$)	1 055
Water Availability per Capita (m^3/a)	1 506
Dam capacity (km^3)	3.46

Introduction

Agriculture accounts for about 48% of the GDP in Ethiopia, an estimated 85% of employment, and 90% of export earnings. The country has a huge water resource potential with an estimated 122 billion m^3 annual surface runoff and 2.6 billion m^3 groundwater. However, most of the rivers are seasonal and about 70% of the runoff occurs between June and August.

State of IWRM Processes

The Water Resources Management Policy of Ethiopia issued in 1999 aims at ensuring efficient, equitable and optimum utilization of the water resources of the country for sustainable socio-economic development. The Water Resources Management Proclamation (2000) is consistent with the water policy. It treats the country's water resources as the common property of the Ethiopian people and the state which plays a major role in the management, allocation, utilization and protection of the water resources of the country. In 2007 a proclamation for establishing river basin organizations was issued to enhance the application of IWRM principles and approaches at the basin level.

The Ministry of Water Resources is the national organization in charge of water sector policy formulation, planning, and water resources development and use. The Ministry is also responsible for the formulation of water resources regulation and the implementation of large-scale irrigation and water supply projects. It also has responsibility for building the capacity of regions for the sustainable utilization of water resources. River Basin Organizations are also emerging to manage water resources at river basin level. Other key players in the management of the water resources are the Ministry of Agriculture and Rural Development and the Environmental Protection Authority.

Ethiopia also has a well-functioning multi-stakeholder forum. The Ethiopia Country Water Partnership (ECWP) and the WASH multi-stakeholder forum serve as platforms for information and dialogue. In terms of financing, an average of 1.143 billion birr, which is about 11% of the Federal Government budget was made available to the water sector annually for the period from 1999/2000-2005/2006. The survey also shows that up to 40.5% of the budget was obtained from external donors with virtually no input from the private sector.

Mainstreaming water resources management in national development

IWRM has been accorded high priority in Ethiopia's five year Plan for Accelerated and Sustained Development to End Poverty (PASDEP). Ethiopia is now moving towards implementing IWRM at river basin level through the establishment of river basin organizations and councils. A water supply and sanitation policy has also been adopted to provide impetus to the development of water supply for human and animal consumption, and for industrial and other uses and to ensure adequate coverage, reliability and acceptable quality, taking the existing realities and future projections of the country into consideration.

The policy is aligned to the Millennium Development Goals (MDGs) where halving the proportion of people without access to clean water and/or adequate sanitation by 2015 is one of the targets. The government has developed a strategic plan to meet the MDGs in the water sector by launching a programme called "Universal Access" which aims at achieving 100% and 98% coverage for water supply and sanitation, respectively by 2012.

Key Opportunities and Challenges

There is a demonstrated high level commitment of the Ethiopian Government to facilitate the IWRM implementation process in the country. Nonetheless, a number of challenges remain, including the establishment of and capacity building for new river basin organizations and sector reforms, increased investment in agricultural water use and flood management, strengthening stakeholder collaboration, ensuring increased access to clean water, increased human capacity and improved sector financing.

KENYA

Population (million)	35.599
Life Expectancy at Birth	52.1
GDP per Capita (US$)	1 240
Water Availability per Capita (m^3/a)	840
Dam capacity (km^3)	4.08

Introduction

Kenya lies on the Indian Ocean, at the equator, bordered by Ethiopia, Somalia, Tanzania, Uganda and Sudan. Until the disputed election results of 2007 Kenya had been politically stable for a long time.

The first draft of the National policy on Water Resource Management for Development was completed in 1999. The document contained good elements for an integrated approach to water management. It recognized the need for an integrated approach to water management, catchment protection, and legal and institutional reforms. However, enforcement issues were not clearly defined. This led to the review of the old Water Act Cap 372 of 1972, and enactment of the new Water Act of 2002.

State of IWRM Processes

The key principles underlying the water sector reforms as outlined in the Water Act 2002 are the separation of policy, regulation and service provision within the water and sanitation sector, separation of water resources management from provision of water and sewerage services to avoid conflict of interest in resources allocation and management, devolution of responsibilities for water resources management and water services provision to the local level to create a sense of ownership and responsibility, and enhancing the sustainability of service provision. This new water resource management structure has been the starting point of the development of an IWRM process. In March 2007, the Ministry of Water and Irrigation launched the draft IWRM Plan. This plan is awaiting finalization and cabinet approval.

The establishment of the Water Resources Management Authority (WRMA) as a semi-autonomous body through an Act of Parliament for the purposes of water resources management has also been a major milestone. Together with this, the decentralization of the water sector through the revision of the water Act has greatly contributed towards the implementation of IWRM in the country.

Key Opportunities and Challenges

Already, discussions among policy makers of the need to revisit the reforms and mainstream IWRM have begun. The sector holds an annual water sector conference to review progress. However, key challenges remain. The institutional arrangements and legal framework are not sufficiently clear and inter-sectoral engagement remains difficult. Financing of IWRM and the construction of infrastructure for flood control are needed, as are better coordination and enforcement of rules and regulations, improved ground water resources management and better data generation and dissemination. To achieve these, there is a need to build a highly skilled professional cadre that can address the challenges.

Catchment management takes hold

One of the key principles underlying the Kenyan water sector reforms as outlined in the Water Act (2002) was the separation of water resources management from the provision of water and sewerage services to avoid conflict of interest in water resource allocation and management. This was accompanied by the devolution of responsibilities for water resources management and water services provision to the local level to create local ownership and responsibility.

Under the Act, six regional water offices (Lake Victoria North, Lake Victoria South, Rift Valley, Ewaso Ngiro North, Tana and Athi) were created according to the country's hydrological boundaries. Each regional office is now formulating a catchment management strategy (CMS) in a consultation with stakeholders, and two of the six have already been completed. The objective is then to develop sub-catchment management plans (SCMPs) which will bring on board local water sector players through the Water Resources Users Associations (WRUAs). In this manner, one of the basic principles of IWRM of inclusion of stakeholders in basin management will have been achieved.

RWANDA

Population (million)	9.234
Life Expectancy at Birth	45.2
GDP per Capita (US$)	1 206
Water Availability per Capita (m^3/a)	1 004

Introduction

The Republic of Rwanda, the land of a thousand hills, is a small, landlocked country in the Great Lakes region of East Africa. It is the most dense in terms of population in Africa, with most of its population engaged in subsistence agriculture. Three quarters of its population live below the poverty line.

In recent years Rwanda has progressed rapidly in addressing IWRM. Previously a sub-component of water and sanitation, water resources management has now become a sub-sector in its own right under MINIRENA. A new water policy was developed in 2004 and is expected to be approved in 2009. This integrates decentralisation, participation and programme-based funding, amongst other approaches. The policy was prepared in consultations with a range of national and international stakeholders.

Practical actions

Rwanda has undertaken some very practical steps to address its water management challenges. One step has been is to address the very serious problem of soil loss and sedimentation. Another has been to improve the information base on the resource.

Hydrological stations that were previously abandoned have been rehabilitated and are operational. Terracing techniques, as a soil conservation practice, have been adopted with some major beneficial impacts in the Rugezi wetland. The 67,500 ha Rugezi wetland in the Southern province is considered internationally to be a critical ecosystem. The practice has helped to convert degraded land into productive areas, resulting in the restoration of this important wetland. The practice has been ranked among the 5 best practices in the study done by NBI-NTEAP/MGP. The terracing practice was used along the Mukungwa River with the support of NBI/NTEAP-MGP.

Rain water harvesting has also shown significant impacts, especially in areas vulnerable to drought. The two practices have been adopted by leaders in the county in their performance contracts (Imihigo). Provisions that promote rain water harvesting are one of the key aspects in the draft water law and will require every household to invest in rain water harvesting practices.

State of IWRM Processes

Rwanda faces major water management challenges such as combating natural resource degradation and meeting the growing development needs of the country. The new water policy will address these needs, including meeting the MDGs and the Rwanda 2020 Vision. The policy also takes into account commitments made through regional and international arrangements related to water resources and the environment. The policy is accompanied by a seven-year programme that proposes the following sector reforms:

- Development of a coordination framework for the sector;
- Decentralization of implementation to the lowest appropriate level;
- Participatory approaches that reinforce the roles of women and children, private sector involvement, capacity building, integrated watershed management, monitoring and assessment.

The new Rwanda Water Law has been approved by Parliament and is awaiting the signature of the President. Currently there is no across-sectoral board to coordinate WRM within the country, but such a structure is proposed under the new law. Under the new water law the government will establish a National Water Commission to focus on project planning, water transfers, the resolution of conflicts and control over public entities.

Key Opportunities and Challenges

Some of the challenges facing the water sector in Rwanda stem from the fact that the IWRM reform processes have only just begun. As a result, there are still large gaps in quality and coverage in water resources assessment, low investment in infrastructure, ongoing environmental degradation and resultant sedimentation of dams. The challenges are compounded by human resource constraints and a growing demand for water.

SEYCHELLES

Population (million)	0.086
Life Expectancy at Birth	72.7
GDP per Capita (US$)	16 106
Dam capacity (km^3)	0.0001

Introduction

The Seychelles archipelago comprises more than 115 islands, formed on the pinnacles of ancient volcanoes, with a total area of 450 km^2. There are two main groups of islands: the Mahe-Praslin which covers 200 km^2 and La Digue Island which covers 10 km^2, while the other island groups consist of coral atolls and sandbanks. As much as 60 percent of the total land area consists of zones that are protected for environmental reasons. Average annual precipitation is 2 330 mm with the heaviest rains occurring on Mahe Island which receives 3 500 mm/year in the north and less than 1,800 mm/year in the south of the island.

State of IWRM Processes

In 2003, total water withdrawal was 12.3 million m^3, of which agriculture accounted for only 7 percent. Most of the agricultural, domestic and industrial waters come from small streams or rivers from the hillsides, depending on monsoons and the rainfall pattern. The abstraction of surface water amounts to around 11.2 million m^3/year (2003) with the rest coming from groundwater. The principal groundwater abstraction is on la Digue Island for domestic and agricultural consumption.

The main institutions involved in the irrigation and water sub-sectors include the Water and Sewage Division of the Public Utilities Corporation which has jurisdiction over all water resources. The Rivers Committee is responsible for water abstraction rights under the Public Utilities Corporation Act of 1985. It also discusses national problems and decides on any development in irrigation and potable water. Water is considered a public good, and its use needs to be controlled so that there is an equitable distribution of this vital resource, with top priority given to water for domestic purposes.

The Rivers Committee is made up of members from the Public Utilities Corporation, the Ministries of Health, Agriculture and Marine Resources, Environment and Natural Resources, Land Use and Habitat, and the Ministry of Industry and International Business. The most important water-related act is the Public Utilities Corporation Act of 1985, which empowers the Rivers Committee to manage all water resources and allows it to prepare project plans for water development in the country. However, the water policy of the country puts most emphasis on the collection of water for domestic purposes.

Key Opportunities and Challenges

The government of Seychelles has established a highly supportive environment for policy reforms across the board. However, some of the key challenges and constraints include low levels of water storage and water harvesting, inadequate financing, weak management of water demand, capacity constraints and low awareness of the benefits of IWRM.

Mainstreaming climate change in national policy

The Republic of Seychelles acceded to the United Nations Framework Convention on Climate Change (UNFCCC) on 22 September 1992, the second country to do so. The main project executed after this process was focused on "Enabling Activities to Prepare the Initial National Communications" to the UNFCCC. The Initial National Communications enabled Seychelles to focus on issues that link climate change to sustainable development, a domain which was not given attention before.

This process has created awareness at all levels within government, amongst local communities and NGOs, and in the private sector. Seychelles was also one of the earliest countries to sign the Kyoto Protocol, on 20 March 1998, which was ratified on 22 July 2002. One of the key requirements of the Kyoto Protocol is the need to identify areas where Seychelles can reduce greenhouse gas emissions through policy formulation and technology promotion, although Seychelles is an insignificant emitter of such gases, and is actually a sink for greenhouse gases. Progress has been made in the follow-up to the Initial National Communications and the Seychelles is looking at technology transfer in various economic sectors in this regard.

SOMALIA

Population (million)	8.196
Life Expectancy at Birth	47.1
Water Availability per Capita (m^3/a)	1 741

Introduction

The long absence of a formal central government, violent conflict in many areas of Somalia and the associated lack of investment are constraints on the rehabilitation and development of water management structures in Somalia. Practically, water management is in the hands committees of local communities. Water user associations exist in some areas, particularly where irrigation is practiced, but there is no clear pattern of water allocation rights and fees. As long as water management continues to be a localized affair, there remains little opportunity for developing effective strategies for the management of rivers and aquifers.

State of IWRM Processes

In Somalia there are no uniform constitutional and legal rules governing water-related social or economic behaviour, except for a 1971 law governing the Water Development Agency. In most of the rural communities, however, traditional Somali law (xeer) and Islamic Sharia law continue to be upheld. The ownership of land and water is based on Somali social organization where each clan is associated with a particular territory. Water resources in rural Somaliland are managed either by committees, or individuals in the case of private sources.

However, in those areas where public administration has been established, advances have been made in restoring the former judicial system. In Somaliland, a draft water Act and a Water Policy were adopted in 2005, while a draft Water Policy for Puntland was completed in 2007.

Unfortunately, the government lacks the capacity to implement the water policy in Somaliland. Water regulations need to be approved by parliament, and the Ministry of Water and Mineral Resources capacitated for effective management of the water sector. The responsibility water resources management and development in Somalia is the responsibility of the Ministry of Mineral and Water Resources (MMWR), and the National Water Centre (NWC), a subsidiary organization of the ministry. The Water Development Agency (WDA) is responsible for operations exploiting groundwater resources for domestic water supply. Unfortunately, these institutions, particularly the latter two, appear to be losing ground fast.

Taking small but bold reforms

The Puntland State Agency for Water, Energy and Natural Resources (PSAWEN) was established under Law No 2 of the State of Puntland, mainly to improve urban and rural water supply. A law (No 20) on Range and Water Management has also been legislated.

The draft water policy for Puntland specifically provides for IWRM with some legislative amendments that will introduce, amongst other things, issues of equity, subsidiarity, water as a social and economic good, allocation of water among competing uses and the polluter pays principle. Key issues outlined in the policy include:

- Negotiation, cooperation and dispute settlement as a means to manage scarce water resources.
- Sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses.
- Prioritisation of uses and allocation to meet human, economic and environmental needs
- Water as a social and an economic good, and
- Decision making at the lowest appropriate level.

Key Opportunities and Challenges

The water resource management challenges in Somalia are huge, and include political instability, acute shortage of financial, human and technical resources, weak institutions, the lack of a legal framework, poor infrastructure for water supply and agriculture and a low awareness of the benefits of IWRM.

SUDAN

Population (million)	36.9
Life Expectancy at Birth	57.4
GDP per Capita (US$)	2 083
Water Availability per Capita (m^3/a)	1 711
Dam capacity (km^3)	8.8

Introduction

Sudan is Africa's largest country and is currently undergoing major social, economic and political change. This is reflected in the complex mix of issues facing the management of water resources in the country. Currently, the MIWR is the lead water sector institution in Sudan, but, the responsibilities and functions of the MIWR were changed under the 2005 Naivasha Peace Agreement, including significant division of responsibilities with a new Ministry of Water in South Sudan.

State of IWRM Processes

All the water resources in Sudan are vulnerable to natural and human impacts including from climate change, over-abstraction and pollution. Sudan has responded to these challenges since 2003 by formulating a first draft of an IWRM & WE plan. The document was titled "25-year Water Resources Strategy (2003-2027)" and was formulated within the framework of the Agricultural Sector 25-year strategy (see box).

Ownership of water in Sudan was defined in the Water Resources Act, 1995. The Act defines ownership as a common good and its management is vested in the State. The act also focuses on the formation of a National Water Resources Council (NWRC).

Water resources management in Sudan is largely decentralized to state-level, with the lowest administrative level being the local council (Mahaleya), which interacts directly with the community. Until now the country has not adopted an organisational framework for water management at river basin level. Accompanying the management plan are three draft versions of a water policy. These are the 1992, 2000, and 2007 versions, developed separately under different initiatives. The latest version was triggered by the peace agreement and initiated by the Minister of Irrigation and Water Resources. A final draft version was approved in 2007.

Key Opportunities and Challenges

The key challenges in managing water resources in Sudan include flood control and early warning systems, the upgrading of monitoring networks and stations, the formulation of water resources strategies and policies, pollution control in surface and ground water resources and better drought and climate change planning. Equally, the development of a proper information systems and the implementation of capacity building programmes are critical.

Long-term planning

Sudan has recently embarked on a process of long-term strategic planning. The new 25-year strategy was prepared by a team of eight people representing the directors of the MIWR general directorates. This document represents an advanced strategic planning initiative by the MIWR and draws from the long experience of agriculture sector strategic planning. It represents a good effort to link sector objectives to wider national development objectives.

The programme has addressed important measures to support water resources management functions including giving special consideration to capacity building which was identified as one of the most important factors in the weak implementation of the previous strategy (National Comprehensive strategy (1992-2002).

A major shortcoming is the isolation of this and similar efforts by MIWR. The need to increase awareness and information on the IWRM process is a continuing challenge that still needs to be addressed.

TANZANIA

Population (million)	38.478
Life Expectancy at Birth	51
GDP per Capita (US$)	744
Water Availability per Capita (m^3/a)	2 440
Dam capacity (km^3)	4.2

Introduction

The major policy governing water resources management in Tanzania is the National Water Policy (NAWAPO). The first Tanzanian water policy was introduced in 1991 and latest revision dates back to 2002. The policy advocates the principle of equity by recognizing the right of access to water for human health, emphasizes a bottom up approach to water management with a clear recognition of the importance of inter-sectoral and multi-stakeholder approaches. This is emphasized by requiring that water management boards at national and basin level should be multi-stakeholder entities. In addition, it recognizes the environment as a legitimate user of water and gives second priority to ensure the protection of biodiversity.

State of IWRM Processes

The Tanzanian government has also developed two bills - one for water resources management and another for water supply and sanitation - that will repeal previous laws that were formulated with a limited sectoral view as opposed to an IWRM approach. These two pieces of legislation will put Tanzania on a stronger IWRM path and separate water resources management from services provision.

To ensure multi-sectoral planning and development of water resources the water boards/committees at national and basin level are composed of representatives from all major sectors including environment, forestry, irrigation and energy. The planning and decision making in these boards therefore takes into account the requirements of different sectors. The water sector is also well represented in various committees dealing with water issues in other sectors, such as the National Environmental Advisory Committee (NEAC) and the National Environmental Standards Committee.

Key Opportunities and Challenges

However, in order to realize the proper management of water resources in Tanzania, a number of challenges still have to be addressed, including greater investment in physical, human, technical resources, building awareness of IWRM issues among key decision makers and developing stronger political support for IWRM, building a strong data base on water resources, enhanced investment in water infrastructure, and the development of the institutional capacity necessary to achieve IWRM.

An institutionalized approach to stakeholder participation

Water is a subject in which everyone is a stakeholder, but the level of participation is affected by political and legal environment in which such processes take place. In Tanzania, the law defines involvement of stake holders at national, basin, catchment and water use scale.

The water management institutions defined by the law include the National water board, basin water boards, catchment water committees and water user associations. The composition of the various boards and committees at all levels ensures the participation of different stakeholders. For example, the national water board is obliged, by law, to be composed of members from agriculture, energy, minerals, trade and industry, forestry, environment, fisheries, lands and water supply services. The board also must include representatives from local government, basin water boards and NGOs. At least two members of the board should be women to ensure gender representation.

The stake holder composition of the basin water boards is the same as the national board but the gender representation has been improved by having at least 3 members as women. The composition of catchment water committees, where the actual activities of water management are done, have greater emphasis of representation of actual users and those affected. There is greater representation of women (1/3 of the members) and a special seat for a representative from a local women's organization. Major private users in the catchment, such as industry and power producers are represented on the committee. Smaller water users are represented by their water user associations.

UGANDA

Population (million)	28.947
Life Expectancy at Birth	49.7
GDP per Capita (US$)	1 454
Water Availability per Capita (m^3/a)	2 207
Dam capacity (km^3)	0.001

Introduction

The constitution of the Republic of Uganda (1995) lays the premise for the Water Act and in objective XXI provides that the state takes all practical measures to promote a good water management system at all levels. In response to water resources management challenges, Uganda has since the early 1990s adopted the principle Integrated Water Resources Management (IWRM) based on the guiding principles on water and environment of the Dublin and Rio de Janeiro conferences. Uganda developed the Water Action Plan (WAP) 1994 based Agenda 21 two central statements on water resources management.

State of IWRM Processes

The first milestone in the IWRM process was the development of the Water Action Plan (WAP) – the first of its kind following the internationally agreed principles from the UN Conference on Environment and Development in Rio de Janeiro in 1992.

In its effort to promote sustainable water resources management the Government undertook the water sector reform. The water sector reform studies were conducted in four sub-sectors comprising: Rural Water Supply and Sanitation, Jan 1999 – June 2000; Urban Water Supply and Sanitation, Sept 1999 – Dec 2000; Water for Production, May 2002 – Jan 2004; and Water Resources Management, July 2003- January 2005. The National Water Policy (1999) provides the overall policy framework for the water sector. The policy emphasizes the recognition of water as being both a social and economic good, whose allocation should give first priority to domestic use. The policy also highlights the key role played by women in all water management and development activities.

The Water Act Cap 152 provides for the establishment of an eleven-member multi-sectoral Water Policy Committee (WPC) as a principal advisory organ to the Minister responsible for water affairs. The country has now been divided into four hydrological management zones and at the local level, catchment management involving a Catchment Advisory Committee and Catchment Secretariats are being set up. A National Water Resources Monitoring network has also been established to monitor the temporal and spatial variation of both surface- and groundwater quantity and quality in Uganda. The network is fully operational and data is collected, quality controlled, analyzed and stored in databases on a regular basis.

Key Opportunities and Challenges

Key challenges still to be dealt with in Uganda include building sufficient capacity for the implementation of IWRM, reviving and strengthening the water policy committee to improve coordination, building capacity at local government level to plan and implement water sector activities, harmonizing environmental and water policies, strengthening private sector participation, increasing access to water especially in rural areas and increasing investment in water infrastructure.

Setting the pace in managing urban water demand

To casual observers', winning comes easy, but this has not been the case for the National Water and Sewerage Corporation in Uganda. The company was voted the Best Public Sector Utility Company in East Africa in 2007, having emerged as the Best Managed Public Sector Company in Uganda in the category that was introduced in the 2007 survey of the East Africa's Most Respected Company Awards. NWSC has firmly taken the lead as an exemplary public corporation that has succeeded where most government-run entities have failed.

One of the priorities of NWSC has been to increase the performance of its water supply systems and reduce the losses to a modest level. This initiative has already started yielding positive results and has led to a reduction in the level of unaccounted for water from 51% in 1998 to 38% in 2004 and 22.2% in 2006/07.

8. Southern Africa: Country Overviews

While Southern Africa is largely semi-arid, there is significant variation in rainfall between countries. Angola is the wettest country, with Botswana and Namibia the driest. There is also significant intra- and inter-annual variation in rainfall. Climate change is likely to exacerbate this variability, reduce precipitation in many areas and increase evaporation, thus increasing water stress many countries. This is in addition to the increasing demand on water resources arising from population and economic growth. A further concern is declining water quality from domestic, agricultural and industrial pollution, and habitat destruction.

The region is subject to episodes of severe and prolonged droughts, particularly in the southwest, while the northern and eastern areas are vulnerable to sometimes devastating floods.

Groundwater provides a domestic water source for about 70 per cent of rural and urban residents throughout southern Africa, particularly in the dispersed settlements and small towns that characterize the region. Lake Malawi, the third largest lake in Africa, is the largest natural lake in the region, and is blessed with remarkable biodiversity which supports both tourism and a local fishing industry.

However, climate change is likely to reduce rainfall across the region, by up to 20% in some parts of South Africa. Increasing temperature will increase already high evaporation rates, reducing run-off and water security. The intensity of floods and droughts are also likely to increase.

Degradation of water resources is a concern in the region, as a result of loss of vegetation, alien plant invasions, and declining water quality as a result of in dustrial, domestic and agricultural pollution. Inadequate sanitation systems result in significant water pollution in and around settlements, with resultant health threats. Agricultural pollution, in the form of excess nitrates and phosphates, is resulting in euptrohication, while increased soil erosion is resulting in sedimentation in dams and high turbidity in rivers. Mining is also a significant source of pollution. In some areas, up to 50 per cent of wetlands have been lost as a result of draining for agricultural or infrastructure development, reduced river flows, over-abstraction of reeds and other materials, and choking of the systems by invasive species.

Southern Africa has the highest concentration of dams and interbasin transfer schemes in Africa, with the major concentration being in South Africa. Several of the other countries are still facing under-development of water resources infrastructure.

In 1997, the Regional Strategic Action Plan I (RSAP I) for water was developed by SADC, which reaffirms the importance of the sub-region's water resources, and their influence on all aspects of the region's economic and social development. The Regional Strategic Action Plan II was developed as a follow up of the RSAP I in 2005. A Regional Water Policy and a Regional Water Strategy have been developed at the SADC level to guide the region in water resources management. In managing Transboundary Water Resources, the countries in the SADC region have ratified the SADC Protocol on Shared Watercourses. A number of RBOs have been established and are developing IWRM Strategies.

ANGOLA

Population (million)	16.095
Life Expectancy at Birth	41.7
GDP per Capita (US$)	2 335
Water Availability per Capita (m^3/a)	8 939

Introduction

The Ministry of Energy and Water is responsible for the planning, co-ordination, supervision and control of development of water resources. It is also responsible for the supply of potable water and the development of national water resources policy. The Water Law approved in 2002 and the regulations have not yet been promulgated. In 2008 the State Secretariat for Water was established to focus on water issues.

State of IWRM processes

Angola is a relative newcomer to the world of IWRM. In 2006, the SADC Water Division in collaboration with the United Nations Environment Programme (UNEP) through the UCC Water extended financial support for a roadmap towards IWRM to be developed.

In April 2007, a report on the current status of IWRM in Angola was analysed by stakeholders in a workshop organised by the Angola Water Partnership. In December that year, a second workshop drafted a roadmap for IWRM in Angola. The workshop selected several priorities for IWRM implementation in Angola, which were shortlisted to the following six:

- Strengthening the role of the PAA;
- Completion of water resource studies and research;
- Promulgation of the Water Law;
- Training of Staff;
- Creation of a management body
- Rehabilitation of technical resources for the reestablishment and consolidation of hydrometric and hydro-meteorological networks; and
- Updating of databases with reliable information;

In February 2008 the Government of Angola organised a National Water Forum which brought together stakeholders from different stakeholders to pave the way forward for the water sector in Angola.

Despite the constraints, some research has been conducted and investments made. At governmental level, some strategies and action plans related to integrated water resource management in Angola were outlined. Legal approaches have been created to rationalise the consumption and development of water resources.

In 2008, the Angolan government established the State Secretariat for Water (SEA) which has prioritised the following issues as key to the establishment of an efficient water resources management policy in the country:

- Re-establishment of the national network of hydrometric stations;
- Establishment of basin commissions;
- Creation of a national institute of water resources management;
- Increasing access to potable water by more than 30% and improving basic sanitation in urban and rural areas;
- Establishing a national strategy for the implementation of IWRM and
- Providing capacity building and access to modern technology to employees in the sector.

Key Opportunities and Challenges

There is significant investment needed in the water sector in Angola. Of primary importance is the rehabilitation of the hydrometric network to be able to monitor the state of water resources and water use, and to provide the data necessary for effective integrated water resources management. This hydrometric network was largely destroyed during 27 years of war.

On the human resource side, training and capacity building of employees in the water sector is sorely needed.

Transboundary water management

The Angolan Water Law focuses on the fair and reasonable distribution of common waters, as well as the promotion, by the regulating agency, of international co-operation activities aimed at adequate management of international hydrological basins.

To support this, an Inter-ministerial Commission for International Waters Agreements was established in September 2003. It is tasked with coordinating the different sectors with a view to implementing international water agreements, as well as creating and overseeing the work of Multi-sectoral Technical Commissions related to water resources.

An Inter-ministerial Commission Technical Support Group (GATECI) for international waters agreements was set up in May 2004 to provide technical support to the Inter-ministerial Commission. Angola is a member of the Cunene Basin Joint Angolan Namibia Permanent Technical Commission, the Permanent Okavango/Cubango River Basin Water Commission (OKACOM), and the Zambezi Watercourse Commission (ZAMCOM).

BOTSWANA

Population (million)	1.836
Life Expectancy at Birth	48.1
GDP per Capita (US$)	12 387
Water Availability per Capita (m^3/a)	6 878

Introduction

Rainfall in Botswana is low, and irregular, making the country vulnerable to water shortages. Most of the potential surface water resources have been developed, leaving little potential for further development. Groundwater is an important source of water, particularly for rural communities, but this resource is increasingly under threat from pollution and over-abstraction. Traditional centralised supply side practices are no longer sustainable, and thus resource management and water conservation and demand management are receiving more focus than resource development.

State of IWRM processes

Although Botswana has not developed a classical IWRM /WE plan, they produced a comprehensive National Water Master Plan, reviewed in 2005, which incorporates all the elements of IWRM, including the environmental aspects of water resources management. The Botswana Country Water Partnership galvanized support for IWRM even before the development of this plan. With support from UNDP-GEF in 2008, the Government of Botswana with facilitation from the Botswana Water Partnership have embarked on the development of an IWRM/WE Plan. A draft National Wetlands Policy and Strategy provides an institutional framework for the management of key wetlands such as the Okavango delta. A draft policy on water conservation has also been developed.

However, the Water Act, which supports implementation of water resources management, dates from 1968 and needs review to provide for public consultation, implementation of water conservation interventions, recognition of environmental water needs and international co-operation in transboundary basins. A draft Bill (2005) has been submitted to the National Assembly for consideration.

While the Ministry of Minerals, Energy and Water Resources has overall responsibility for policy formulation, planning, development and management of the country's water resources, planning is split between two departments: the Department of Water Affairs for surface water and the Department of Geological Survey for groundwater. The DWA is responsible for water allocation. The NWMP recommended a major review of the institutional arrangements.

While data on national water and waste water stock is limited and spans only a short timeframe, Botswana none the less uses this data to create national water accounts.

Transboundary Water Resources Management

Botswana has participated in transboundary water resources management initiatives for a considerable length of time. The most notable initiative has been the management of the Okavango Basin together with Angola and Namibia. The Permanent Okavango River Basin Organisation (OKACOM) was the first River Basin Organisation (RBO) in Southern Africa. The OKACOM experience has guided the formation of other basin management organisations in the region.

Botswana is also involved with processes in the Orange Senqu, Zambezi, and Limpopo river basins. A special feature of Botswana's participation in these initiatives is the country's focus on the participation of as broad a spectrum of stakeholders as possible, from central government to the community level. Decision makers at all these levels are aware of the need for integrated water resources management. This was recently demonstrated through the participation of Ministers and Senior Officials from the Ministries of Environment and Tourism, Agriculture, Lands and Housing, Foreign Affairs and local Government in a national workshop convened by the International Rivers Unit of the Ministry of Minerals, Energy and Water Resources to discuss the implications of Botswana's participation in transboundary water **resources management. The experience with the Every River Has its People initiative in the Okavango is a flagship of this focus.**

Key Opportunities and Challenges

As water demand and waste water generation increase, Botswana will need to introduce water conservation and reuse systems that promote sustainable water use into the future. In the same vein, water can no longer be considered to be a free good – water users must realize the value of water and pay for it, but within a framework that protects the poor.

The water sector needs to engage with other sectors, particularly the agricultural sector, to address challenges on the ground.

As with most countries in the region, there is a need to invest in the development of human resources.

LESOTHO

Population (million)	1.981
Life Expectancy at Birth	42.6
GDP per Capita (US$)	3 335
Water Availability per Capita (m^3/a)	1 515
Dam capacity (km^3)	2.82

Introduction

Lesotho, a small, land-locked country, entirely surrounded by South Africa, lies within the Orange-Senqu basin and is the source of the Orange-Senqu River. The highlands of Lesotho are also home to some unique wetlands. The Lesotho Highlands Water Scheme enables Lesotho to benefit from the transfer of water to South Africa, receiving annual royalties from South Africa that contribute 5% of GDP. Interestingly, agricultural water use in Lesotho is less than industrial and domestic use.

State of IWRM processes

While the Lesotho water sector is in transition, it remains fragmented and requires improved co-ordination to achieve integrated water resources management. An IWRM Strategy and a Water Demand Management and Drought Management Strategy have been developed by the Commission of Water with support from the World Bank. While Lesotho does not have an IWRM plan, there are aspects of water resources management that accord with the principles of IWRM. Water resources management is governed by the 2007 Water and Sanitation Policy. The Ministry of Water Resources is primarily responsible for water resources management, and the Commissioner of Water is responsible for the co-ordination of water institutions and the development of water policy. Execution and monitoring is done centrally through the Department of Water Affairs, under the 1978 Water Resources Act. This legislation has, however, been revised, and is awaiting gazetting.

A number of platforms for stakeholder participation in water resources management exist, including meetings with stakeholders, held by every quarter by the Water Commission. A series of workshops with stakeholders has also been held.

Lesotho is working through a Sector-wide Approach to water management, and planning and budgeting is done through this mechanism. None-the-less, co-ordination remains a challenge between the several institutions active in the water sector. The Lesotho Government with support from the EU and OECD have developed a Financing Strategy for the Water Sector.

Key Opportunities and Challenges

Some of the key challenges in Lesotho include controlling and reversing catchment degradation, drought management, equitable sharing of transboundary waters, developing the capacity to implement IWRM, in improved irrigation management and planning. There is also a challenge in ensuring that IWRM planning is incorporated into the National Development Planning, and in developing a clear implementation plan for the roll-out of the 2007 policy. As with all other countries in the region, the building of human capacity to manage water resources remains a major challenge.

Sharing the benefits in a transboundary basin

The headwaters of the mighty Orange-Senqu River basin rise in Lesotho, making transboundary issues related to management and resource use of high priority for Lesotho. IWRM measures undertaken in Lesotho affect downstream states, be they structural or management interventions. The Lesotho Highlands Water Project shows how Lesotho and South Africa sharing the benefits of using Orange River water. The water is supplied under gravity from Lesotho to South Africa. Lesotho receives royalties for the water conveyed to South Africa, while South Africa saves the costs of pumping the water from the Orange River in its lower reached inside South Africa. Lesotho uses the financial benefits of the LHWP to supply more water and electricity to its people and to raise the standard of living for all.

MADAGASCAR

Population (million)	18.643
Life Expectancy at Birth	58.4
GDP per Capita (US$)	923
Water Availability per Capita (m^3/a)	17 590
Dam capacity (km^3)	0.493

Introduction

Madagascar, a large island state off the east coast of Africa, suffers not from water constraints (average annual rainfall is 1 600mm), but from human, financial and institutional constraints that limit the effective management of its water resources. Water resources are managed by the Ministry of Water, under the 1998 Water Act. The Ministry is a recent development, having been established in 2008.

State of IWRM processes

The 1998 Act calls for the co-ordination of water resource management activities, determines that water is a common good of the nation, and requires the protection of water resources. It also proposes the establishment of a national water resources Fund. However, for a number of reasons, IWRM is Madagascar is stronger on paper than in implementation. Many aspects of the legislation have not yet been implemented.

The topography of Madagascar plays a critical role in the mode of water resources management. Because of the size of the country, and difficulties in accessing different areas, it has been divided into six catchment areas, each with a decentralized water agency, basin committee, and local basin committees. Stakeholder consultation takes place at the local level. Unfortunately, the local structures are weak, and co-ordination at the national level is poor. Management is hampered by poor data and lack of co-ordination between the various institutions responsible for monitoring, and a lack of clarity generally on the roles and responsibilities of the various structures in the water sector.

Infrastructure remains a major challenge, being either inadequate, or in need or rehabilitation. Management of water flows and water quality in inadequate, as is monitoring and enforcement of legislation and regulations. While the Water Act makes provision for authorization of water use, this is not yet implemented.

Catchment Management

In order to deal more effectively with the issue of water rights and to ensure local awareness and participation of stakeholders in the WASH programme, six decentralized catchment management agencies have been established in Madagascar. However, the basin committees need empowerment in order to achieve better management of IWRM processes in their areas. The National Water and Sanitation Authority (ANDEA) with the Ministry of Water share the responsibility for co-ordination of catchment planning. Master Plans must be established for each catchment area and managed through an IWRM approach and in accordance with the National Water Master Plan.

Key Opportunities and Challenges

The water sector institutions of Madagascar need to be strengthened so that they can give force to the legislation currently in place, including tighter control of pollution and abstraction. There is significant hydropower potential that can be developed in Madagascar which will provide a cheaper source of energy than thermal energy sources. The rehabilitation and refurbishment of infrastructure provides an opportunity for increased water use efficiency and reduced operating costs. The decentralization to catchment level should be carried through in the development of an IWRM master plan for each catchment. However, for this to be achieved, the water resources institutions need to be strengthened and funding must be sourced for activities including infrastructure development and rehabilitation.

MALAWI

Population (million)	13.226
Life Expectancy at Birth	46.3
GDP per Capita (US$)	667
Water Availability per Capita (m^3/a)	1 273
Dam capacity (km^3)	0.043

Introduction

The existence of Lake Malawi and other smaller lakes makes Malawi one of the most blessed countries in Southern Africa in terms of water resources availability. However, climate variability, climate change and poor water use and management practices, pose daunting challenges which could see access to water resources strained in the near future.

State of IWRM processes

The National Water policy of Malawi was developed through a consultative process that has resulted in significant buy-in from a range of stakeholders. This was followed by the development of an IWRM/WE plan, completed in 2008, although not yet finally adopted. The five key areas identified in the IWRM/WE plan are:

- Policy, legal and institutional environment (the "enabling" environment);
- Integrated Catchment Management;
- Sustainable Water Resources Utilisation;
- IWRM Institutional Capacity Building; and
- IWRM Institutional Coordination and implementation.

Collaboration between the Ministry of Irrigation and Water Development and the Malawi Water Partnership has resulted in greatly increased awareness of IWRM in the country (see side box)

The Ministry of Irrigation and Water Development is the apex ministry for water resources management. A National Water Resources Agency and Catchment Management Authorities are due to be established to manage and allocate water resources.

Strides have been made in tree planting to restore catchments, and in the controlling of water disposal. The Department of Agriculture has reversed the policy that allowed for cultivation on steep slopes and river banks.

Key Opportunities and Challenges

While Malawi has a revised water resources policy and an IWRM/WE plan, the legislation dates from 1969 and requires revision to align with IWRM approaches. Aligned with this, there is a need to review the institutional arrangements for water resource management, and put in place the necessary institutions. Ensuring adequate financing, and human capacity for these institutions is also a key challenge. The government has committed itself to effective monitoring and evaluation, but considerable work is needed to put in place an effective system and to rehabilitate the hydrometric network. This will also require capacity building, and the provision of technological and financial resources.

Collaboration

The Ministry of irrigation and Water Development and the Malawi Water Partnership collaborated in a programme to raise awareness on IWRM in Malawi. This was achieved through a series of consultations involving Members of Parliament, Chiefs, Chief Executives of companies and parastatals, Principal Secretaries of government ministries and their Directors, Directors and officials of Non-Governmental Organisations and Community-based Organisations, academics and others. The development of a common vision for water during these consultations led to a fuller understanding of the benefits of integrated water resources management amongst participants.

However, water management remains male-dominated and representation of women in the water sector is unacceptably low. To address this, the government hired a consultant to ensure gender mainstreaming in the various projects under the National Water Development Programme II, and to build capacity at the district level, amongst local service providers and at the community level to effectively plan, design, construct and sustainably manage water supply and sanitation systems while addressing cross-cutting issues of gender and HIV/AIDS.

MAURITIUS

Population (million)	1.241
Life Expectancy at Birth	72.4
GDP per Capita (US$)	12 715
Water Availability per Capita (m^3/a)	2 198
Dam capacity (km^3)	0.093

Introduction

Mauritius is a small island, formed through volcanic processes. The lava flows are very permeable and constitute the groundwater reserves on which Mauritius is partly dependent. A decreasing rainfall trend over the past 60 years, and over-exploitation of groundwater make Mauritius increasingly vulnerable to water scarcity. Diffuse agricultural pollution, leachate from on-site sanitation, and pollution from sugar and textile industries contribute to the water management challenges.

State of IWRM processes

In June 2007, the Government of Mauritius produced a draft National Water Policy which provides the strategic direction for the development of IWRM. It has not yet, however, been published A new Water Act is currently under development.

Metering of water use

Most of the boreholes for groundwater exploitation in Mauritius are metered so that abstraction can be measured. This has resulted in proper recording of the groundwater potential and the abstraction, leading to the realization that Mauritius is reaching the upper limit of groundwater exploitation within the Young Volcanics (i.e. the Intermediate and Young Lava Flows). This, in turn, led to a policy decision to prospect into the Intermediate and Old Volcanics by drilling boreholes to greater depths for better yields, although the long-term sustainability of this approach remains to be ascertained.

Three main bodies in the water resource sector – the Water Resources Unit (WRU), the Central Water Authority (CWA) and the Wastewater Management Authority (WMA) operate under the aegis of the Ministry of Renewable Energy and Public Utilities (MREPU), which is the main body responsible for policy formulation and implementation of water resources management. The Central Electricity Board is responsible, inter alia, to the management of 8 hydropower plants.

On-going assessment of water resources through the monitoring of surface and groundwater has allowed a fairly accurate assessment of sectoral water allocation across the various economic sectors (agriculture, hydro-power generation, domestic, industrial, (including sugar), and commercial use, including tourism). This puts Mauritius well ahead of many other countries in the region in the monitoring and assessment of its water resources. Monitoring of water use efficiency is also fairly well developed as are water conservation interventions. The sugar industry, for example, uses cooling water in closed circuit systems which significantly reduce water use.

While a number of dams are in place in Mauritius to harness surface water flows, the potential exists for further development of storage infrastructure.

All groundwater abstractions on the island are authorized and renewed every one to three years. Information on abstraction and quality must be regularly submitted. An assessment of reservoir status has been conducted and rehabilitation is being implemented on prioritised dams.

Key Opportunities and Challenges

The monitoring system on surface waters needs to be extended to cover all rivers and the hydrometric network needs to be upgraded. Monitoring of water quality also needs to be enhanced. There is also a need to rationalize the water rights under the new legal framework which is due to be introduced. The new Water Act, when promulgated, will allow for the rationalization of the institutional arrangements and improved enforcement of regulations.

MOZAMBIQUE

Population (million)	20.533
Life Expectancy at Birth	42.8
GDP per Capita (US$)	1242
Water Availability per Capita (m^3/a)	10 353
Dam capacity (km^3)	64.5

Introduction

Due to its location, Mozambique is susceptible to a wide variety of natural disasters ranging from floods and droughts to cyclones and earthquakes. These extreme events are likely to be aggravated by climate change, making effective water resources management particularly important in Mozambique. Added to this is the challenge that Mozambique is highly dependent on water from upstream countries, particularly in the southern region, and that the vulnerability of people to water related disasters is exacerbated by high levels of poverty.

State of IWRM processes

The current institutional arrangement in Mozambique was established under the Water Law of 1991, the subsequent National Water Policy of 1995 and the Revised Water Policy of 2007. The Ministry of Public Works and Housing (MOPH) and the National Water Directorate are responsible for water resources management and water supply and sanitation to urban and rural areas.

A Water Resources Strategy based on the principles of IWRM has been developed and in 2008, the Department of Water Affairs with support of the Country Water Partnership in stakeholder involvement has embarked on the development of an IWRM MasterPlan.

An inter-sectoral coordination body, the National Water Council (CNA), is a consultative and co-ordinating body for the Council of Ministers. The CNA includes all ministries responsible for water related issues and is supported by a Technical Committee and a Secretariat administered by the National Water Directorate (DNA). The DNA is the key institute responsible for planning and management of the water sector.

Five Regional Water Administrations (ARAs) are envisaged as being responsible for the progressive implementation of IWRM. To date, four have been established (ARA-South, ARA-Central, ARA-Zambezi and ARA-North). The setting up of ARA-Central North is at an advanced stage.

Although the policy and strategy recognise that need to protect environmental flows current international methodology for determining flow needs to be adapted to Mozambique's needs. A regulation for water licensing and concessions has been approved which guarantees the availability of water for domestic use and promotes rational water allocation in the best interests of the development of the country. In terms of monitoring, each Basin Management Unit (BMU) within the ARAs has a network of stations under its management, including precipitation stations, and hydrometric stations.

Key Opportunities and Challenges

Despite progress, there are still a number of challenges relating to the implementation of IWRM in Mozambique. Firstly, IWRM is not widely understood outside the water sector, and there are overlapping functions in relation to water management. Secondly, there is a lack of financial resources to sustain water resources management and for further infrastructure development. Poor availability of reliable data and information hampers effective water resources management, compounded by lack of capacity at all levels.

Capacity building

The ARA-North Catchment Authority surveyed the capacity building needs of its employees, committee and Rovuma Basin parties and developed a capacity building programme that is now being implemented. The programme covers a range of general and technical topics related to IWRM. The programme should improve the skills of the ARA-North technical staff, and the capacity of the Rovuma Basin committee members and stakeholders to facilitate improved information exchange and awareness of water resource issues in the basin. The intention is that, as a result of the programme, Rovuma Basin stakeholders and users will be better able to negotiate and defend their interests the Rovuma Basin.

The programme has already resulted in increased awareness of IWRM awareness amongst ARA-North staff and Rovuma Basin committee members.

The National Water Partnership (PNA), which includes members from various institutions and sectors presents an opportunity to improve IWRM awareness, to drive participatory processes for decision makers on water resources development, to revise legal instruments and to build human resources capacity.

NAMIBIA

Population (million)	2.02
Life Expectancy at Birth	51.6
GDP per Capita (US$)	7 586
Water Availability per Capita (m^3/a)	8 656
Dam capacity (km^3)	0.709

Introduction

Namibia is the most arid country in the region, with limited and unpredictable rainfall, and the only perennial rivers on its borders. As a result, Namibia has had to focus strongly on demand management rather than infrastructure development. Unfortunately, while the principles of IWRM are well accepted, there have been delays in revising the legislation, which still awaits promulgation.

State of IWRM processes

Namibia has been at the leading edge of water demand management in the region for some time, including the conjunctive use of water and the use of unconventional sources. However, limited human resource capacity is hindering the implementation of other elements of IWRM.

Environment Water Requirements

Environmental Water Requirements (EWRs) have been determined for the Lower Orange River but have not been achieved. The process of establishing EWRs on the Okavango River has been initiated. However, to date, no internationally accepted methods exist for assessing the EWRs of ephemeral river systems. Nevertheless, there has been an attempt in Namibia to determine adequate environmental water releases from the Oanob Dam. The intention is to maintain the Camel thorn (Acacia erioloba) woodland in the floodplain immediately below the dam. This was one of the first government initiatives in Namibia to assess EWRs. Other studies have been done on the Karst aquifer and the Kuiseb River.

Namibia is embarking upon the formulation of an IWRM plan with an expected completion date of mid-2010. The intention is that decision makers at all levels are aware of and involved in the process as far as possible. The Namibian Water Partnership is working closely with the government in the development of this plan.

The Department of Water Affairs and Forestry is responsible for water allocation and water resources management, including monitoring and pollution control. NamWater, a public utility, is responsible for the management of all large dams and bulk water pipelines. No new dams have been built since 1990, although some studies on potential sites have been done.

Abstraction and discharge permits are recognised in the Water Resource Management Act for 2004 and the Water Policy for 2000 and are supported by the still-in-force Water Act of 1956. The Division of Water Environment within DWAF is tasked with the issuing of permits for effluent discharge to water bodies. The Division of Geohydrology in DWAF carries out monitoring of groundwater resources and provides advice and guidance to the division of law administration that grants abstraction permits. DWAF further monitors compliance according to the policy and legislation and issues fines for non-compliance.

Namibia is divided into 11 river basins in which two Basin Management Committees have so far been established. Efforts towards establishment are ongoing in four others. However, the basin management committees are not able to carry out their mandates because of financial and human resource constraints.

Key Opportunities and Challenges

The formulation of the IWRM Plan for Namibia will create further opportunities for IWRM implementation. Equally, the finalization of the legislation will allow for the creation of the proposed water resource management institutions. The IWRM plan will, amongst other things, look at the issue of sustainable financing for IWRM implementation, and the need for capacity building in the country. Limited technical capacity remains a constraint to the implementation of IWRM.

Namibia continues to seek innovative mechanisms to conserve water. Unconventional water sources are regarded important and are being applied and further explored.

SOUTH AFRICA

Population (million)	47.939
Life Expectancy at Birth	50.8
GDP per Capita (US$)	11 110
Water Availability per Capita (m^3/a)	1 036
Dam capacity (km^3)	28.5

Introduction

South Africa is a water scarce country, with most of its large river basins shared with neighbouring states. While the economy is largely driven by manufacturing, mining and services, agriculture remains the largest water user. As a result of its political past, the country has huge disparities in wealth and in access to water for productive purposes, with the poor black majority still, in many ways, on the margins of the economy. The government is faced with significant challenges in ensuring both the more equitable use of water, and the sustainable use of water in the face of scarcity and climate change. The Department of Water is responsible for the management of the nation's water resources.

State of IWRM processes

In 1998, the National Water Act was promulgated, supported by a White Paper on a National Water Policy for South Africa which was approved by Cabinet in 1997. The new legislation moved away from the previous riparian rights system to the vesting of custodianship of water in the government, and a system of time-bound allocations. The new legislation also introduced decentralized Catchment Management Agencies, the protection of environmental water requirements through the Reserve, the protection of water for basin human needs as a right, and the prioritization of water for international purposes above national use requirements. The Act also allowed for the reallocation of water to meet redress requirements and to ensure protection of water resources.

At the time, the legislation was hailed as one of the most significant pieces of water legislation in the world. However, implementation has proved more challenging. While 8 Catchment Management Agencies have been established on paper, only one is truly functional, while one other has a Board but no staff as yet. The reserve requirements have been determined for >40% of the water resources, but implementation and monitoring of the reserve are poor. Reallocation programmes have been initiated to meet redress and reserve requirements, but progress has been slow.

South Africa has, however, made significant achievements in a number of areas. A well-developed infrastructure platform supports economic growth despite the vagaries of climate and rainfall. Stakeholder participation in many processes, such as the development of the National Water Resources Strategy has been extremely effective, although there are still challenges in engaging effectively with poor communities. South Africa is currently developing a Water for Growth and Development Strategy which aligns water planning with economic opportunities and needs.

Key Opportunities and Challenges

South Africa is faced with the challenge of ensuring effective implementation of excellent policy and legislation. In this regard, the establishment of Catchment Management Agencies, and the development of sufficient capacity to staff them effectively is an important step. Equally, DWAF, the national custodian of water resources, is experiencing severe capacity challenges that must be addressed.

The pending review of the National Water Resources Strategy offers an important opportunity to address some of the weaknesses in the implementation of IWRM to date. In this regard, the development of a Water for Growth and Development Strategy sets a new direction for IWRM implementation in South Africa with significant opportunities for improved approaches and implementation.

Developing a National Water Resources Strategy

In 2005, South Africa published its National Water Resources Strategy, which sets out the vision, strategies and guidelines for integrated water resources management in South Africa. This document was, at the time, a path breaking document in setting out the intentions for water resources management in the country, and was widely consulted on. In 2008, under pressure to respond to the development demands of the country, the Department of Water Affairs and Forestry initiated a process to update the alignment of water resources planning with the economic and social objectives of the country, through the development of a Water for Growth and Development Strategy. This document, still under development, describes the economic and development opportunities and constraints in the face of increasing water scarcity, and takes South Africa into a more advanced phase of IWRM planning.

SWAZILAND

Population (million)	1.125
Life Expectancy at Birth	40.9
GDP per Capita (US$)	4 824
Water Availability per Capita (m^3/a)	3 978
Dam capacity (km^3)	0.585

Introduction

The Government of Swaziland, with support from the Global Water Partnership, is preparing an integrated water resources management plan. The priorities for water use and development in the country include the promotion of the participation of smallholder farmers in irrigated agriculture, and the full implementation of the Water Act of 2003.

State of IWRM processes

The 2003 Water Act consolidated the administration of water under one ministry. Water is now managed through the National Water Authority (NWA) which is composed of representatives from government ministries (Ministry of Agriculture, Ministry of Economic Planning and Development, Ministry of Natural Resources and Energy and Ministry of Health and Social Welfare) three representatives from industry (Swaziland Sugar Association, Swaziland Citrus Board and Swaziland Chamber of Commerce and Industry) and three representatives from associations, co-operatives and individuals on Swazi Nation Land. This representation enhances public and commercial involvement in water resources management.

The Act calls for the establishment of basin level structures (River Basin Authorities, Irrigation Districts, Water User Associations and Project Boards in exceptional cases) with significant powers to manage water resources. The Act also established the Department of Water Affairs to provide secretariat services to the NWA and oversee management of water resources development and management issues in the country.

The government of Swaziland has prioritized the participation of smallholder farmer organizations in irrigated agriculture and other enterprises as part of a rural poverty eradication programme. To support this, they have embarked on the construction of dams and reservoirs designed to increase the availability of water to smallholder farmers. Two large dams have been constructed within the past six years. Maguga dam serves smallholder farmers in the Komati catchment, while the Lubovana dam serves smallholder farmers in the Usutu catchment.

The Water Apportionment Board issues water use permits, although the river basin authorities will take over this function once they are established. Water for irrigation is allocated on the basis of crop water requirements. It is, however, not necessary for any person or community to obtain a permit for use of water for primary (subsistence) purposes.

All five river basins in Swaziland are shared with neighbouring countries (Mozambique and South Africa), making development on water resources subject to international agreements and protocols. Swaziland, South Africa and Mozambique have established commissions and committees to safeguard development of these international water bodies. They include the Joint Water Commission established by the Government of Swaziland and the Republic of South Africa, the Komati Basin Water Authority established by the Government of Swaziland and the Republic of South Africa, and the Tripartite Commission established by the Government of Swaziland, the Republic of Mozambique and the Republic of South Africa.

River Basin Authorities

The Swaziland Department of Water Affairs is currently in the process of establishing five River Basin Authorities. Currently, interim steering committees, elected by basin stakeholders, have been established. The original intention was to establish the River Basin Authorities within five years of signing of the Act, but so far, only two have been established. The establishment of these two River Basin Authorities was facilitated by the presence of existing stakeholder organisations in the basins. In the Komati basin, small-scale irrigated farmers had already created water user associations, and were using water from Maguga dam under the Komati Downstream Development Project. In the Usutu basin, small-scale farmers fall under the LUSIP and are in the process of forming water user associations. The small-scale farmers responded positively when meetings were called to discuss water issues, and to nominate their representatives to the basin authority.

Key Opportunities and Challenges

To move forward with IWRM implementation in Swaziland, it is important to complete the establishment of the River Basin Authorities and to make sure that they have effective secretariats. Capacity building, training and retaining of staff of DWA, the strengthening of institutions offering water related courses, improving the metering and accounting for water, developing innovative funding mechanisms, improving information dissemination, and development and finalisation of policies and regulations are also important.

ZAMBIA

Population (million)	11.478
Life Expectancy at Birth	40.5
GDP per Capita (US$)	1 023
Water Availability per Capita (m^3/a)	8 994
Dam capacity (km^3)	106

Introduction

Zambia has made significant progress in aligning water planning with national development planning through inclusion of integrated water resource management programmes in the Fifth National Development Plan (2006 – 2010) and the Vision 2030. The adoption of an IWRM/WE plan in 2008 also sets the enabling environment for the implementation of IWRM, despite the delay in the adoption of the revised Water Policy of 2007 and the revised Water Resources Management bill, drafted in 2006.

State of IWRM processes

The Ministry of Energy and Water is the apex water ministry in Zambia, responsible for overseeing water resources development and management and for policy development for the sector. A National Water Authority and decentralized catchment councils are planned under the pending legislation.

Despite the age of the prevailing legislation (1948) water trading is allowed between water users in Zambia, as long as the total water abstraction does not exceed what was granted by the Water Board (WB).

Commercial Utilities have been established to provide urban water services. These Utilities use metering, leak detection and tariffs to deter wastage in the domestic and industrial sectors. The Mpongwe Wheat Scheme, Nakambala Sugar, and the Kaleya small-holders irrigation scheme also practice water demand management. Despite the improved water use efficiency, Zambia is in need of further investment in water resources infrastructure to provide increased water storage.

While a natural restoration project is in place on the Kafue flats, environmental requirements are not yet established for Zambia as a whole.

In February 2009, key performance indicators and targets for water management were developed. These key performance indicators are still under discussion by the Water Sector Advisory Group committee on monitoring and evaluation. For monitoring water resources management implementation, 3 to 6 indicators are foreseen to track progress on the implementation of the Fifth National Development Plan, , but within the water sector more indicators may be helpful. A specific challenge for Zambia is the lack of baseline information against which to monitor progress.

Key Opportunities and Challenges

The major constraint in the Zambian water sector is the non-adoption of the revised National Water Policy of 2007 and the non-enactment of the Water Resources Management Bill of 2006. A further challenge to effective water resources management in Zambia is the poor state of the monitoring infrastructure, which suffers from limited coverage, and limited human capacity, resulting in unreliable data to support IWRM.

A final challenge is that of underdevelopment of infrastructure - Zambia needs to enhance investment in water infrastructure to ensure sufficient storage to support social and economic development.

Co-ordination

In order to improve co-ordination in the development of the Fifth National Development Plan, the Zambian Government introduced a Sector Advisory Group for each sector, through which the plan was approved. The Water Sector Advisory Group (WSAG) organized itself into four strategic inter-sectoral sub-committees covering water resources management, water resources infrastructure development, water supply and sanitation; and monitoring, evaluation and capacity building. The Water SAG advises government on policy issues, sector performance, efficient/effective water use, transparent management and sub-sectoral coordination and provides a forum for a Sector Wide Approach (SWAp) to planning, budgeting, and implementation of programmes. It comprises representatives from key institutions and stakeholders which currently include the line ministries, statutory bodies, cooperating partners, academic and research institutions, NGOs and other associations actively involved in the water sector.

ZIMBABWE

Population (million)	13.12
Life Expectancy at Birth	40.9
GDP per Capita (US$)	2 038
Water Availability per Capita (m^3/a)	1 512
Dam capacity (km^3)	103

Introduction

Political instability and an economic turmoil in Zimbabwe have weakened the country's water resource management capacity so that, off a relatively strong platform, some of the indicators of effective water resource management are declining, rather than improving. A key aspect of this has been the drain of human capacity from the country, and the lack of financial resources for water resources management. Nonetheless, the country has made progress in the implementation of IWRM approaches.

State of IWRM processes

Following on from Agenda 21 (Rio, 1992), Integrated Water Resources Management (IWRM) was placed at the forefront of water management in Zimbabwe. In 1998, following a long consultation and drafting process, the Zimbabwe Parliament passed the Water Act.

The Act vested water rights in the President, and introduced time bound water allocations instead of riparian rights. In 2000 a Water Resources Management Strategy was adopted and endorsed by Parliament.

The Ministry of Water Resources and management is the apex ministry, under which are the Zimbabwe National Water Authority (ZINWA), the catchment councils and the sub-catchment councils.

Stakeholder engagement happens at the level of catchment and sub-catchment councils. The issuing of permits is delegated to catchment councils, which are representative of water users. Draft catchment outline plans have been developed at the catchment level.

Zimbabwe shares six major rivers with its neighbours and its policy is to ensure co-operation on the sustainable utilisation of these resources.

Key Opportunities and Challenges

The Water Act is under review to remove weaknesses and internal conflicts and to align the Act with other legislation. The streamlining of water management institutions is being planned, including a new structure for the Ministry of Water. Inter-sectoral co-ordination remains a challenge.

Limited human, financial and institutional resources are hampering integrated water resources management in Zimbabwe. Equally, limited data, particularly on groundwater, makes effective water resources management difficult and a comprehensive monitoring and evaluation system is needed.

The new political dispensation provides an opportunity for re-engagement of development partners and donors with the water sector in Zimbabwe.

Catchment planning

In accordance with the Water Act (1998), draft Catchment Outline Plans (COPs) have been developed for all seven catchments, in consultation with sub catchment councils and the Zimbabwe National Water Authority (ZINWA). The draft plans have a 20 year planning horizon, subject to review every five years. The Catchment Outline Planning process involves the definition of the catchment boundaries, population determination, determining water resources availability, assessing the existing situation in the catchments, stakeholder involvement, land use assessment, resource protection, efficient utilization of the resource, and the development of an integrated management plan. Water quality issues and environmental aspects are also covered in the COPs. Zimbabwe is also actively involved in the development of IWRM strategies in its transboundary basins.

Despite the achievements, the development of the COPs was slow due to lack of capacity, financial constraints and lack of coordination among institutions. Since long term water permits cannot be issued in the absence of approved plans, temporary permits are being issued until the final approval of the COPs.

9. Moving Forward

Eastern and Southern Africa share some challenges and opportunities in moving forward with IWRM planning, but also have their own set of challenges and opportunities. Eastern Africa, for example, does not have a strong single sub-regional political body and many countries are still facing challenges of political stability. As a result, the challenge of raising the profile of water in national government agenda is still huge.

9.1 Building Capacity

Capacity building, of institutions and technical capacity, remains a priority in all countries. Institutional capacity development programmes must be enhanced to enable transboundary and national institutions to cope with current and future water management demands. Part of this is the enhancement of the skills of frontline water managers and practitioners at regional, country and local government level, and the forging of both South-South and North-South partnerships to foster information, experience, knowledge and technological exchange. Regional dialogue and networking and greater investment in the scientific capacities of institutions charged with information and knowledge generation will also foster improved water management in the region.

9.2 Policy, Legislation and Institutional Development

It is critical that countries finalise and implement their policy and legislative reform, and their institutional arrangements as soon as possible. Long delays in these processes are paralysing the delivery of IWRM.

9.3 IWRM Planning

In a number of countries the process of IWRM planning needs to be supported and accelerated. The AfDB is well placed to provide technical and financial support for planning processes in a manner that ensures that IWRM plans embrace the development priorities and objectives of the specific country, and that the plans are aligned with actual capacity to implement.

The CWPs, on the other hand, have a critical role to play in ensuring stakeholder engagement in these processes, in driving targeted awareness raising programmes, and in engaging with representatives of key government departments to ensure that the understanding of the importance of IWRM to sustainable social and economic development is widely understood.

The IWRM plans should clarify the mechanisms to be employed to build capacity for implementation, drawing on existing training and capacity building programs, and identifying gaps where appropriate. The capacity to be built should be focused on the implementation of the identified priorities first.

Critically, the IWRM plans must include water resources infrastructure requirements, taking into account requirements to adapt to climate change, and for flood and drought management, as well as storage and distribution issues. In this regard, the GWP needs to engage infrastructure development as a key part of IWRM planning, since it is currently absent from their toolbox on IWRM.

Despite progress, there is still a need to improve engagement between the water sector and national development planning, particularly in relation to water resources management.

9.4 Financing of IWRM

The sustainable financing of IWRM remains a major challenge in most countries. The AfDB, as a financing institution, can contribute through funding specific IWRM initiatives, but, as importantly, should assist countries to examine the potential for long-term sustainable funding through in-country resources such as fiscal support and user-pays approaches. In particular, this requires raising the water resources profile amongst finance Ministries, particularly in the context of adaptation to climate change, to improve the budgeting for water resources interventions at country level.

The surveys also revealed, however, that there is financing available that is not being accessed by countries that need it. There is, therefore, a need for the AfDB to deepen the debate on the current challenges in accessing financing in both regions and to make recommendations on how external financing opportunities could be better tailored to meet the needs of the countries.

Arising from this is the need for the development of briefing documents that take a look at the challenges of financing of water resources development and management in the region and providing guidance on appropriate financing options at project and country level.

9.5 Monitoring

Monitoring remains a key weakness in water resources management in Eastern and Southern Africa. There are two dimensions to monitoring that must be addressed. The first is the monitoring of the status of water resources (surface and groundwater). This is an appropriate area for intervention and support by the AfDB, both in terms of the development of monitoring infrastructure and systems, and in training and capacity building.

The second dimension is the monitoring of IWRM implementation and the impact of IWRM at national, transboundary and regional level, to support countries and basin organizations in the ongoing strategic dialogue on the implementation of IWRM in the region. There is a key role for the Regional Water Partnerships, in association with key partners, such as the AfDB, AMCOW and the regional economic structures, and other stakeholders, to develop appropriate indicators and mechanisms for the monitoring of IWRM implementation and the impact.

9.6 Linking IWRM and Climate Change

At present many countries in the two sub-regions are concerned about the impact of climate change on the pattern and intensity of rainfall, as well as on temperature rises. Already some countries experience high inter-annual rainfall variability and preparing for greater extremes of variability is one critical planning issue. Currently-available climate models are unable to point to particular changes at a national level. At a sub-continental level, they indicate that both the Eastern and Southern Africa region are likely to receive an increase in rainfall overall, but that the pattern and frequency will change towards more intense, extreme events that are less easily predicted. It is important that Water Resources Management is increasingly promoted as a pillar for adaptation to climate change in the countries with additional mitigation measures from investment in energy.

The truth of the matter however is that in many cases investment in water and energy are not seen in the wider context of adaptation and mitigation but rather, as stand alone measures that need to be made. Even in countries where national climate change adaptation plans have been developed, there is little evidence that ministries for water and environment are collaborating in this regard, which many of the IWRM plans as well as national adaptation plans remain disconnected. Greater coordination is required in this respect but much more importantly, the need to strengthen the capacities of the countries in the two regions to assess climate change risks and integrate adaptation and mitigation in all aspects of national planning is huge.

Because IWRM promotes the holistic approach to water resources management and recognizes that there are multiple pathways to building resilience, it provides the best framework within which to respond to climate change, with a judicious mix of both hard (investment on infrastructure) and soft (institutional and management) strategies.

9.7 Countries in Most Need

Table 3 below sets out, on the basis of the two studies, an assessment of the countries most in need of intervention and support, and the areas in

which the support is most needed. This assessment is purely on the basis of little progress having been achieved in this regard in these particular countries. However, it should be noted that little may have been achieved in these areas because they are not of high priority, and any interventions should be married against the priorities of each country.

Table 3: Countries that have little progress in key action areas

Opportunity for Action	Country
Policy and Legislation	Comoros, Somalia
Infrastructure Platform	Angola, Burundi, Djibouti, Mozambique, Somalia, Sudan
Sustainable Financing	Angola, Burundi, Djibouti, Eritrea, Madagascar, Malawi, Mozambique, Somalia, Sudan, Zambia, Zimbabwe
Institutional Arrangements	Comoros, Djibouti, Somalia, Sudan, Uganda
Institutional Capacity	Comoros, Ethiopia, Somalia, Zimbabwe
Iwrm Planning	Somalia
Water use Efficiency	Burundi, Comoros, Djibouti, Eritrea, Lesotho, Madagascar, Malawi, Rwanda, Somalia, Zimbabwe
Stakeholder Engagement	Somalia
Allocation Mechanisms	Angola, Burundi, Djibouti, Eritrea, Rwanda, Sudan, Zambia
Monitoring and Information	Kenya, Rwanda, Somalia, Sudan, Tanzania
Environmental Sustainability	Burundi, Eritrea, Kenya, Sudan, Zambia

10. Conclusion

The GWP regional and country water partnerships have been key facilitators of IWRM processes in the southern and eastern African regions. Equally, the AfDB has played a key role in promoting and financing integrated water resources management interventions in the two regions. None-the-less, the recent surveys indicate that there is still considerable work to be done in achieving IWRM in these two regions, thereby ensuring that water is used sustainably to support much-needed economic and social development.

While Eastern and Southern Africa share some challenges and opportunities in moving forward with IWRM planning, they also have their own sets of challenges and opportunities. Eastern Africa, for example, does not have a strong single sub-regional political body and as a result, the challenge of raising the profile of water in national government agenda is perhaps overshadowed by such other priorities. In Southern Africa, on the other hand, while there are still political stability issues in some countries, SADC has played a strong role in driving a water agenda and ensuring that it is high on the agenda of the various countries. Similarly, SADC has played a critical role in driving transboundary agreements, while the Eastern African region is progressing more slowly in this regard – not least due to the political and hydrological complexity of the Nile Basin.

The two studies in Eastern and Southern Africa have revealed good practices in different areas of IWRM in different countries. Other countries in the regions could benefit from learning about these processes, as much as they could benefit from learning about approaches that have failed in other countries in the region. A common platform for sharing experiences between countries would be of enormous benefit to the two regions.

Some common challenges can also be identified across the two regions. The first is that, despite progress, there is still a need to improve engagement between the water sector and national development planning, particularly in relation to water resources management. While delivery of water services is often reflected in national development plans, the role of water resources management in underpinning sustainable economic development is still not sufficiently recognized by other sectors in government.

Related to this is the need for greater recognition of the role of water in poverty eradication and social development programmes, looking at the role of water in food gardens and micro-enterprises, and ensuring that allocation mechanisms are appropriate for these uses.

To achieve these ends, and to ensure effective water management, the long-term task of building a well-trained cadre of water managers and technical specialists must continue. So too must the processes to establish sustainable funding mechanisms for the implementation of IWRM, whether through fiscal appropriations or water use charges. A key element of this is ensuring the funding for proper maintenance and rehabilitation of infrastructure, including monitoring infrastructure.

Ultimately, an appropriate mix of institutional capacity, financing, human skills and infrastructure are needed to enable countries in Eastern and Southern Africa to cope with the uncertainties associated with climate variability, and with the increasing severe impacts of climate change.

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