Financing of water resources management

Experiences from sub-Saharan Africa

Interim Report May 2012

EU Water Initiative – Finance Working Group (EUWI-FWG), GWP, Drottninggatan 33,
SE-111 51 Stockholm, Sweden, Phone: +46 (0)8 522 126 30, Fax: + 46 (0)8 522 126 31
www.euwi.net

Financing of water resources management:

Experiences from sub-Saharan Africa

Formed in 2003, the European Union Water Initiative Finance Working Group (EUWI-FWG) is focused on helping to shape the financial strategy of the EUWI. The FWG encourages innovation, the development of institutional and regulatory frameworks and capacity building. It also encourages the use of development funding as a catalyst to leverage other forms of finance, including national budgets, donors, user and private finance, to improve access by the poor to water and sanitation services. The EUWI FWG is hosted by the Global Water Partnership, which provides secretariat and administrative support.

Acknowledgements

This interim report has been written by James Winpenny and Alan Hall of the EUWI-FWG, and Palle Lindgaard-Jørgensen of UNEP-DHI, based on case studies from three countries in Africa. The case studies were prepared by Felix Ankomah Asante and Alfred Asuming Boakye (Ghana), Guy Pegram and Barbara Schreiner (South Africa) and Mugisha Shillingi (Uganda) with funds from the EUWI-FWG and UNEP-DHI. The report also incorporates contributions from GWP-Southern Africa and was reviewed by Roberto Martin-Hurtado and members of the Finance Working Group.

EUWI-FWG
c/o GWP
Drottninggatan 33
SE-111 51 Stockholm
SWEDEN

www.euwi.net/wg/finance

May 2012

Preface

Little work has been done on the financing of water resources management (WRM). And yet financing requirements are increasing because of the development deficit and are exacerbated by new demands from climate change, urbanisation, population growth, food needs and the threats of drought and floods – to name but some of the future challenges. It is not just about financing infrastructure and services, there are also funding needs for the *integrating function;* areas such as governance, information gathering, monitoring, regulation, forecasting, training and capacity building.

Unlike the situation for water supply and sanitation services, financing for WRM is poorly understood. The EUWI-FWG, GWP, OECD and UNEP-DHI have worked together to examine this issue and stimulate a more structured approach and understanding of financing for WRM. The work has included a series of financing workshops in eight regions, organised by the GWP regional water partnerships (see EUWI-FWG and GWP, 2012). It also included a seminal Expert Group meeting at the OECD in March 2010, which brought together experts from many countries to focus on this complex subject, perhaps for the first time. Finally, building on the OECD work, the EUWI-FWG and UNEP-DHI supported a series of three case studies in Africa and this report focuses on the outcomes of these case studies.

The study confirms that, in sub-Saharan Africa, financing for WRM is not given prominence in the water world and is presently under-funded in many countries. Financing can be described as *ad hoc,* driven by demands from a range of users with little WRM coherence. The more profitable uses of water are given prominence, leaving other parts deprived. There is considerable difficulty in dealing with an area which is institutionally fragmented and with financing across a broad range of disparate parts of the water domain. The multiplicity of functions has tended to defeat a viable comprehensive approach. The introduction of an integrated approach to water resources management, especially since 2002, has considerably improved the ability to take a more holistic approach at the policy level, but it has not, as yet, translated into financing. If needs are not understood or measured and management is not effective, then access to finance will remain difficult.

It is to be hoped that the information contained in this report and the lessons it presents will be of interest to other African countries, as well as developing countries outside the African continent, and will set them on the road to a more coherent approach to financing WRM. This is an interim report and it is the aim that other partners, including UNEP-DHI, will continue to develop the ideas presented here and undertake more analysis of financing for WRM. .

Alan W Hall
Chair,
EUWI-Finance Working Group

Contents

Abbreviations and acronyms

ACP	Africa, Caribbean and Pacific (countries)
ACP-EUWF	ACP-EU Water Facility
AFD	Agence Française de Développement (French Development Agency)
AfDB	African Development Bank
AICD	Africa Infrastructure Country Diagnostic
AWF	African Water Facility
BMZ	Bundesministerium für Wirtschaftliche Zusammenarbeit (German Federal Ministry for Economic Development Cooperation)
BOOT	Build, own, operate, transfer
BOT	Build, own, transfer
CIDA	Canadian International Development Agency
CMA	Catchment management agency
DAC	Development Assistance Committee (of the OECD)
DANIDA	Danish International Development Agency
DFID	Department for International Development (UK)
DP	Development partner
DWA	Department of Water Affairs (South Africa)
ECOWAS	Economic Community of West African States
EIB	European Investment Bank
EU	European Union
EUWI-FWG	European Union Water Initiative-Finance Working Group
GDP	Gross domestic product
GEF	Global Environmental Facility
GoU	Government of Uganda
GoZ	Government of Zambia
GWP	Global Water Partnership
IAS	Invasive, alien species
ICA	Infrastructure Consortium for Africa
IGF	Internally generated funds
IWRM	Integrated water resource management
IFI	International financial institution
JWSSPS	Joint Water Supply and Sanitation Programme Support
KfW	Kreditanstalt für Wiederaufbau (German Development Bank)
KOBWA	Kobati Basin Development Authority
LHDA	Lesotho Highlands Development Authority
LVBC	Lake Victoria Basin Commission
LVEMP II	Lake Victoria Environmental Management Project Phase II
MDG	Millennium Development Goal
NBI	Nile Basin Initiative
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental organisation
NWA	National Water Act (South Africa)
NWRIA	National Water Resources Infrastructure Agency
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
OMVS	Organisation pour la Mise en Valeur de fleuve Sénégal
ORASECOM	Orange-Senqu River Commission
PPP	Public-private partnership
REC	Regional economic commission
SADC	Southern African Development Community

SFP	Strategic financial planning
SIP	Strategic investment plan
SWAP	Sector Water Assistance Programme
TCTA	Trans-Caledon Tunnel Authority
TWM	Trans-boundary water management
UNEP	UN Environnent Programme
UNICEF	UN Children's Fund
WDCS	Waste discharge charge system (South Africa)
WRC	Water Resources Commission (Ghana)
WRM	Water resources management
WS&S	Water supply and sanitation
WSSD	World Summit for Sustainable Development
WWC	World Water Council

1. Introduction – scope, context and rationale

Water resources management (WRM) aims to provide national water security, which underpins social and economic development. WRM includes water governance, public stewardship and the provision of the infrastructure necessary for realising the many services that water can offer.

While progress has been made in improving the supply of finance for water supply and sanitation, little has been done on financing for WRM. This report is a step in that direction. It draws on case studies from South Africa, Uganda and Ghana, plus other country-specific data, and also draws on recent work at the Organisation for Economic Co-operation and Development (OECD).

There is evidence that in many countries WRM is inadequately funded, partly because of general fiscal and financial constraints, but also because the benefits of WRM are not fully understood. This report re-states these benefits, and describes how three very different African countries are dealing with this challenge.

Scope

The ultimate goal of WRM is to provide water security for a country. Water security has been described as "… the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies." (Grey and Sadoff, 2007).

In these terms, what water security entails will vary greatly between countries and regions, and will be shaped by local rather than global solutions. Water security underpins economic development in many ways – food and energy provision, human health, environmental sustainability, impacts on migration and conflict, etc:

> "Achieving water security to support growth and to build climate resilience is at the heart of water resource management in Africa. Water security reflects a country's ability to function productively in the face of water vulnerability. It is a precondition for sustaining and increasing investment returns and achieving dynamic economic growth." (Foster and Briceño-Garmendia, 2010, p. 271)

Thus WRM is a key element of any development agenda, though it is often taken for granted. Given rapid demographic change (population increase coupled with increased wealth) and climate change, WRM in pursuit of water security will feature more prominently in future development agendas.

The scope of this paper includes the approach to integrated water resources management (IWRM) as proposed at the UN Conference on Environment and Development in 1992 and included as a planning target in the 2002 World Summit on Sustainable Development (WSSD). It includes effective water governance and all the measures entailed in the public stewardship and efficient use of water resources. Some discussion of infrastructure is inevitable, since this is necessary to provide water security, but this paper will not deal to any depth with financing infrastructure for directly productive services which have been extensively covered elsewhere (see Foster and Briceño-Garmendia, 2010, and other references in the Annex).

Context

Two aspects of water security have been singled out for international targets. The first is the provision of adequate domestic water supply and sanitation (WS&S) services for people. The second is the management of water resources to sustain economic activity and to ensure long term protection of this important form of environmental capital. The first of the above is the subject of Target 7C of the Millennium Development Goals (MDGs) and has received considerable attention since 2000. The second dimension has not been prominent in the international development agenda. Its only international recognition has been the target set at the WSSD (2002), which called for countries to prepare IWRM and water efficiency plans by 2005. Whilst many countries have adopted integrated approaches and drafted plans (a recent UN-Water survey indicates some 80% of countries have made progress on IWRM planning), progress on implementation of the plans has been weak.

Work on financing for water has focused mainly on water supply, with the seminal Camdessus Report 'Financing Water for All' (2003) influencing the agenda of a number of key agencies, including OECD, UNEP and the major international financing institutions (IFIs). Financing for water services has become a mainstream issue in water dialogues and the clear link between financing and good water governance is now widely accepted.

Whilst progress has been made on financing for WS&S, little has been done on financing for WRM. The Camdessus report recognised this and recommended studies on financing for WRM. The Global Water Partnership (GWP) set out a framework for financing and water governance in a Background paper (Rees et al, 2008) which the OECD has built on with a series of case studies, mainly from OECD member states. This has led to a report *Financing Water Resources Management* (forthcoming 2012). The OECD work presents a framework which we draw on for this paper. The European Union Water Initiative-Finance Working Group (EUWI-FWG) and UN Environment Programme (UNEP) supported the OECD process and prepared case studies for developing countries to complement the case studies undertaken by OECD for its member countries. Through this report, the EUWI and UNEP are supplementing the work of the OECD by bringing together information from the case studies to focus on financing WRM in sub-Saharan Africa.

Three specific case studies were carried out by local experts, in Ghana, South Africa and Uganda. As part of the 5th Southern African Development Community (SADC) Water Dialogue, supplementary data was collected for several countries in southern Africa[1]. The EUWI-FWG also commissioned a study on financing for trans-boundary waters as this is a specific issue of importance for Africa. The present paper brings together findings from these activities. It sets out the issues and shares experiences on financing WRM in sub-Saharan Africa in order to increase knowledge and prompt actions to help African countries raise finance to tackle their WRM challenges.

[1] SADC, The 5th SADC Multi-Stakeholder Water Dialogue, Watering development in SA:C, Swaziland, June 2011, and GWP-Southern Africa, Regional Paper on Financing water resources management. overview from five countries, Swaziland, June 2011.

Rationale

The need to improve the management of water resources has been thrust centre-stage by the experience of the variability of the costs of water, the damage caused by water-related disasters, the effects of water on economic performance and concerns about protecting water-dependent environments.

There is evidence that WRM in many countries is not adequately funded and that there is a shortage of policy analysis and guidance on the sustainable financing of WRM. It is surprising that in the 21st century very few countries (rich or poor) have any idea of how much they spend on WRM and what value it provides. As the world enters an era of natural resource and financing constraints this is no longer acceptable.

Recent analyses of water resources financing in Ghana, South Africa and Uganda and dialogues on financing water for climate resilience to ensure regional security in Southern Africa are important elements in bringing the issue to the attention of African policy makers and administrators.

While the African continent has enough water at an aggregate level, many countries struggle to cope with the huge spatial and temporal variability of water resources. Weaknesses in the use and management of water are increasing the pressure on overall economic and socio-economic development and threatening environmental sustainability. Climate change, demographic changes – particularly urbanisation – and other socio-economic changes will place additional pressures on water resources, with repercussions for economic and social development in Africa.

Managing water resources incurs costs. However, water competes with other pressing needs, and often loses out because the benefits of WRM are not properly valued and understood. This paper moves the subject forward, from what needs to be done to how these needs can be financed, based on real experiences from several African countries.

2. A typology of WRM

There is no hard-and-fast definition of WRM. However, most agree on the need to distinguish water resources from water services. It is also a useful starting point to identify WRM with the provision of public goods, both at the national and trans-boundary levels, though this is not a watertight category.

To simplify and focus discussion, for the purposes of this paper WRM is divided into three categories. First is ***governance,*** *which refers to basic administrative and management functions, normally provided and funded by the state from national budgets. Second is water* ***stewardship****, which includes the preservation and enhancement of the quantity and quality of water resources, which may require some infrastructure. Third, and with a substantial overlap with this, is the provision of* ***strategic infrastructure*** *for water services and other functions that are user-oriented and thus offer scope for the sale of services to users and beneficiaries, and for the involvement of private partnerships and finance.*

There is no hard-and-fast definition of water resources management (WRM), and the term continues to be used in a different sense by different agencies and writers. The case studies drawn on in this paper illustrate the different uses of the term. While all agree on the inclusion of governance, policy-making, stakeholder engagement, research, monitoring, etc,

and on the inclusion of a range of 'stewardship' functions, there is some variance in whether certain water services, such as household water and sanitation, and wastewater treatment, should also be included.

The broad scope of 'water' as a topic, and the fuzziness of WRM, add to the difficulty of giving meaningful guidance about financing such a diverse range of functions and activities. However, a few general points can be made in order to narrow down the topic to manageable proportions.

A distinction can be drawn between water governance and stewardship, on the one hand, and the provision of user-oriented infrastructure for water services and productive functions, on the other. The former are concerned with looking after water *as a resource*, while the latter is concerned with providing *specific social and economic services* from that resource.

But even this basic distinction can be challenged; wastewater treatment is a service, but it is also an aspect of resource management. Facilities built to manage water resources (such as dams and flood control structures) can be, and are, used to provide water services for which users will pay. Although WRM stresses many of the 'soft' functions involved, there is no escaping the need for 'hard' items, such as infrastructure and equipment, necessitating major capital spending to complement recurrent budgeted items. In short, there needs to be flexibility and pragmatism in discussions of the scope of this topic.

That said, the distinction between water resources and services is a useful starting point since the two have separate – though overlapping – financing menus and agendas. The development and management of water resources, necessarily though not exclusively, involves a high proportion of public implementation and finance. In contrast, the provision of user-oriented water services is, in principle, more attractive to commercial operators and lends itself to private funding. This is another way of saying that the former involve the provision of *public goods* while the latter entail *private goods*.

2.1. WRM as a public good

Identifying WRM with *public goods* is a useful mindset with which to approach the topic. However, it is complex and does not always fit neatly into this category (Box 2.1). There is a need for further research, beyond the scope of this paper, to develop a more robust philosophical basis for understanding the position of various aspects of WRM within the political economy of a country. For more information see Rees et al (2008) and Martin-Hurtado, (2012).

Box 2.1. Public and private goods

A **public good** is a product or service which is:

- *Non-excludable*. Once it is provided, it is impossible to exclude any user from enjoying its benefits. This implies that a private provider would be unable to enforce payment from users (the *free rider* issue)
- *Non-rival*. One person's use has no effect on the amount available for others. Thus there is no economic case for charging for it – using price to ration its quantity would be pointless, and would result in sub-optimal use.

Private goods have the opposite characteristics to those above. It is feasible for private agents to supply and finance such goods and services, since full payment can, in principle, be recovered from users.

It is also important to note that there are other 'goods' which do not fit easily into the public or private definition. There are **common-pool resources** (e.g. unregulated fishing or

groundwater abstraction) where user charges are not possible unless they are regulated and converted to private goods. There are also **merit goods** which society considers should be provided to people (such as clean water for the poorest) where some user charge is possible but warrants subsidy.

It is important in the African context to recall that public goods are not only *national*, "The management of *transboundary* waters is considered to be a regional public good" (Joyce and Granit, 2010, p. 4).

The same function or service can be either a public or private good in different circumstances.

- If a dam and reservoir built for power and irrigation services were deliberately oversized in order to provide strategic drought or flood protection, its 'excess' size is a public good, which would be a candidate for subsidy, to supplement the revenues from sales of services
- There are also situations where household water, which is essentially a private good for which users are prepared to pay, is heavily subsidised by tariff control, which authorities may justify on the grounds of public health externalities from the provision of adequate amounts of clean water
- Likewise for household sanitation which can be regarded as a *merit good*. Centralised wastewater treatment is, however, best regarded as a public good, since householders are rarely willing to pay the full economic cost of its provision
- Condominial sewerage is an intermediate form where individual householders cooperate in initiating and part-funding sewerage in their immediate districts.

Table 2.1 illustrates where certain common water services appear on the public-private spectrum.

Table 2.1. Water as a public and private good

Public good	Private good
• Policy-making • Water pollution monitoring and control • Restoration of water quality in public water bodies • Preservation and enhancement of watery ecosystems and habitats • Major works entailed in flood prevention and control • Strategic water storage and multi-purpose infrastructure for river basin management • Public sewerage and wastewater treatment	• Urban piped water distribution • Household sanitation • Servicing household latrines (e.g. emptying and disposal of latrine contents) • Household septic tanks for collection of wastewater • Irrigation water services to individual farmers • Groundwater extraction • Water supply for productive businesses (industrial, power, processing, mining, tourism, etc)

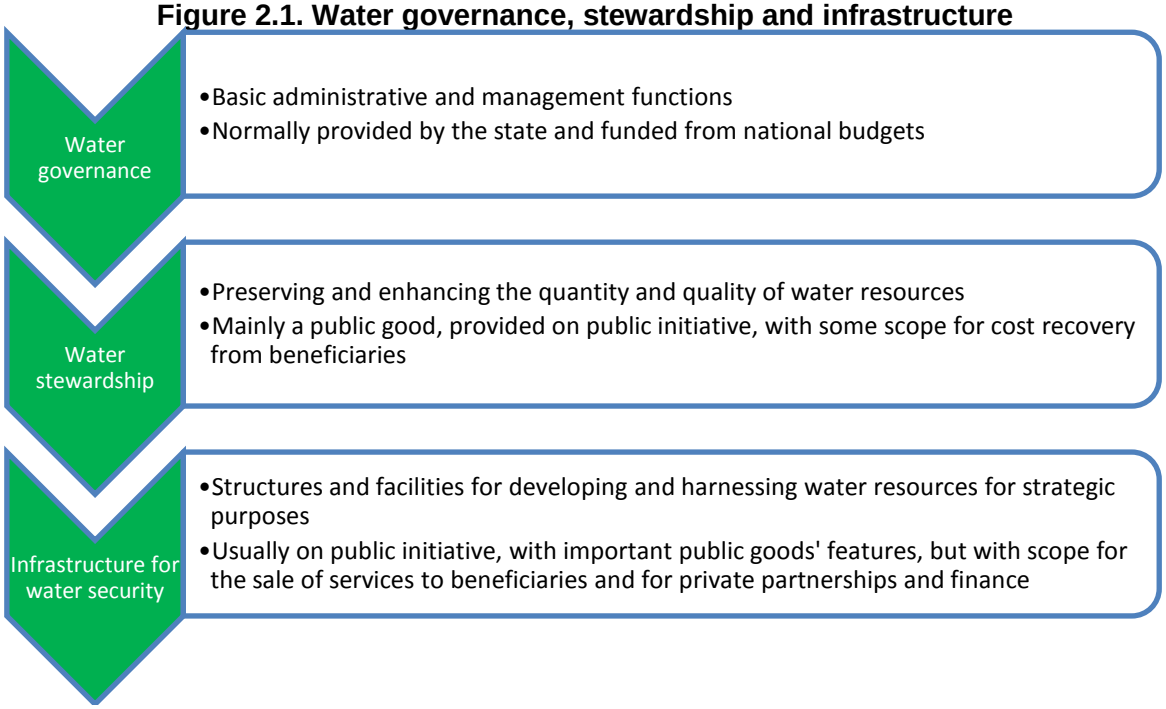
There are other important qualifications to the public-private paradigm.

- The fact that certain services, which are essentially private goods, may *actually* be provided and financed by public authorities (e.g. domestic water supply or the distribution of irrigation water to farmers), does not alter the fact that these services can be regarded as private goods and treated as such for financing purposes

- Conversely, other services actually provided and funded by private agents may contain public goods' characteristics which would justify some public subsidy. There is also the opposite case where private goods incur *public bads,* where potential public harm is entailed, and some regulation, tax or penalty is called for
- Once certain public goods are provided and funded by the public authorities, it may be possible for their cost to be defrayed, wholly or in part, by charges made to users (e.g. levies on property developers to cover the cost of flood protection), or by the sale of produce (e.g. timber) or rights (hunting, fishing) because of providing public amenities. It may also be possible to attract private sponsorship to offset the cost of certain services, where the motives are philanthropic (e.g. afforestation, environmental protection, wildlife support), e.g. by the offer of tax incentives.
- Some public goods are *collective goods and services,* the beneficiaries of which can be identified and potentially required to contribute to the costs of the measures. Flood risk management is a public good, but local schemes benefit a defined group of the population, who could be asked to contribute towards the cost of higher degrees of flood protection than would normally be justified. River basin development and sea/flood defence in France and the Netherlands is partly funded from the specific beneficiaries in each river basin or Water Board region. In Korea downstream river users pay towards the upper basin watershed management.

A more in-depth analysis of this topic is warranted but is beyond the scope of this paper and for the purposes of this report the discussion of WRM is simplified by dividing it into three categories – governance, stewardship and infrastructure for water security (Figure 2.1).

Figure 2.1. Water governance, stewardship and infrastructure



2.2. Water governance

This includes the critical governance and 'integrating' functions to create the enabling environment for the management of water. If these functions are not properly funded the results will soon be felt in the shape of under-investment and inefficiencies in the wider water economy.

The following governance categories, as set out in the South African case study, are typical:

- Policy, planning and legislation, including coordination between sectors, international and trans-boundary cooperation
- Monitoring and routine data collection and analysis to provide the basis for decision-making, policy formulation and design
- Research
- Administration of water use, including licensing, regulation, conflict resolution and arbitration
- Institutional development and stakeholder engagement, including capacity development and public awareness
- Corporate affairs, coordination, financial management and other overheads.

Many of these functions are not expensive to perform *per se*, although in aggregate the cost can become sizeable. The functions are complex and spread across different ministries and jurisdictions. They are funded mainly from budget allocations and may not be well documented or easily identifiable as part of WRM. Nevertheless, they are critical for efficient and effective development and for reducing the risk of failure of physical works, reducing corruption and waste and helping to avoid 'white elephant' projects that are wasteful and consume scarce public funds. Financing governance can also leverage private investment in infrastructure, since it builds confidence and reduces perceived risk.

2.3. Stewardship

Stewardship of water entails a mixture of public goods that provide the social infrastructure critical to well-being, sustainability and inter-generational equity. They include:

- Environmental protection
- Maintenance of water quality
- The collection and treatment of wastewater and disposal of its effluent
- The re-use and re-cycling of water
- Flood management
- Watershed and catchment management
- Urban drainage
- The control of pollution and restitution of contaminated waters
- Eco-system protection
- Drought alleviation.

Such measures can be very costly, relying on government initiatives and funded mostly from taxes. There is, however, some scope for cost sharing and cost-recovery, and the possibility of cross-subsidising pure public goods from revenue earning water use services. Stewardship functions are spread over many public authorities – ministries of water, public works, agriculture, energy and power, transport and environment, basin organisations, municipal and local governments, etc. NGOs, charities and civil society networks have an important role too. Private business is also increasingly concerned about stewardship in the context of their 'water footprint' which is perceived as a threat to their long term business operations and reputation. Thus there is great scope for involving business as a partner in implementing and financing water stewardship, for both commercial and philanthropic motives.

The South African case study includes the following stewardship activities in WRM:

- Ecosystem management
- Pollution abatement
- Wastewater treatment
- Flood risk management and flood control
- Strategic water storage and drought management

- Navigation
- Drainage
- Catchment protection and afforestation
- Cleaning and clearing lakes and rivers of vegetation and polluting substances

The tasks entailed in WRM are also well illustrated from the operational priorities set out in the Ugandan National Development Plan for water.

Box 2.2. Allocation priorities for WRM in Uganda

- Improving water security and emergency response to water related disasters in the country
- Management of water resources at the catchment level in the four water management zones
- Strengthening regulation of the use of water resources and pollution
- Promoting regional co-operation for equitable and conflict-free use of shared water resources
- Monitoring the state of water resources in the country through establishment of new water monitoring stations and continuous data collection of ground water, surface water and water quality
- Strengthening national and regional capacities for water quality analysis
- Assessing and mapping water resources (groundwater and surface water)
- Improving regulatory and management procedures for large and small hydraulic works
- Establishment of a National Water Institute.

DWRM Uganda case study, p. 15

Box.2.3 illustrates a public 'bad', the remediation of which falls to the state. In this case, the 'free riders' may be in other countries, as well as polluters and victims in the host country.

Box 2.3. Invasive alien species (IAS): protection and integration

In many countries in Africa invasive species in rivers and lakes causes considerable WRM problems leading to poor water quality, reduced supplies and fishing/navigation constraints. In Zambia power generation was reduced by more than 20% in May/June 2009 because of IAS. The economic costs have not been calculated, but are significant. In Uganda losses to fisheries, energy, transport, etc. arising from water hyacinth was estimated to be USD 112 million per year in 1998. Also the cost of such pollution management falls on the state (taxpayers) even though it is often caused by nutrients discharged into waters by agriculture and industry. This is a classic free-rider problem and shows the importance of adopting an integrated approach with coordination across sectors.

GWP Southern Africa, 2010, p. 37

2.4. Infrastructure for water services and productive functions

In every country, water resources have to be developed, harnessed and managed to enable all potential users to be satisfied. Economic growth comes from the productive uses of water, including energy (thermal and hydro), agriculture, industry, commerce, livestock, navigation, mining, fisheries, recreation and tourism. Water for household use is essential for personal welfare, and underlies all other directly productive uses.

All countries need a *minimum platform* of investment in water infrastructure, as well as institutions, to provide them with water security. Below this minimum, societies are too vulnerable to water shocks and unreliable water supplies to satisfy the needs of productive

and human livelihoods. The content of this 'minimum platform' will vary by country. In some cases it will require major works and structures – dams and reservoirs, river basin management, flood control, water transfer schemes, etc. – while elsewhere the infrastructure will be smaller and more diffuse. It is the former that are the main concerns of this paper, though there is no clear distinction between these two conceptual categories. As the South African case study notes the line between water resources projects and bulk water supply infrastructure is often blurred (e.g. when bulk water supply systems act as inter-basin transfers).

The South African paper documents the growth of the 'minimum platform' of infrastructure to the point where it not only provides for the needs of large and dynamic productive sectors in agriculture, mining and manufacture, but, since 1990, also increasingly responds to the household needs of a growing and previously under-served population. Prior to 1994, gross domestic product (GDP) was affected by severe national droughts, whereas more recent droughts have had much less impact.

Strategic infrastructure provides a public service, but also supports private goods which can be priced at full cost. These productive services are readily financed by governments and IFIs as they contribute more directly to the economy and returns can be easily quantified. Often these services are managed in 'sector silos' as stand-alone projects with high capital costs. Funding is available from various sources with a range of instruments; governments can provide equity, seed funding or initial costs, joined by public-private partnerships (PPP), and the whole package containing a mix of loans and grants.

3. The benefits of WRM

Water brings benefits to all aspects of daily life, and practically all economic activities have water as an essential input to production. Whilst there are indications that policymakers understand the important contribution WRM makes to national aspirations for economic and social development it does not yet translate into financing.

Measurement of the size of these benefits, progress in quantifying them in economic terms and in identifying specific beneficiaries is important in making the case for WRM and maximising the potential for cost recovery from users. The methodologies for doing this are under-developed in the case study countries, despite the acceptance in South Africa, to name but one case, of the vital nature of water development to its economic progress in recent decades.

Water brings benefits to all aspects of daily life and virtually all economic activities involve water as a necessary production factor, either directly as in agricultural production, or in the value chain, as in the processing of agricultural products, cooling and cleaning processes and in waste disposal.

There are numerous examples of improved WRM that have economic benefits beyond productive purposes – including reduced costs of supplying and treating water for drinking, improved health, avoiding human and economic losses from floods because of early warning systems and flood protection, reduced costs for energy production from the use of hydropower and reductions in water borne diseases.

In Africa there is a clear notion that WRM contributes to national goals for economic and social development. WRM features prominently in the national development plans of both Uganda and Ghana (Box 3.1).

Box 3.1. Water in Uganda's National Development Policy

The Uganda case study links the benefits of WRM, domestic water supply, sanitation and water for production directly to the Poverty Eradication Action Plan (2004) and subsequent Five Year National Development Plan, 2008. This includes the benefits from enhancing production, more competitiveness and higher incomes from the improved production of goods, services and energy. Improved water governance will provide security, conflict resolution and disaster management (especially in north Uganda) through provision of water and sanitation services in camps for internally displaced persons, cattle corridors and arid areas of the country. Finally, human development will accrue from improved sanitation facilities in schools thus improving education potential and improved health from water and sanitation systems.
(DWRM, Uganda case study, 2010, p. 11)

The benefits of infrastructure development have long been recognised. Much less recognised are the benefits from less obvious and lower cost activities, like early warning systems for floods and drought warnings, improved monitoring and water resources planning. Identifying benefits and beneficiaries is important in making the case for improved water management. Benefits may accrue to specific groups rather than society as a whole. Identifying the specific beneficiaries will give a better focus to the case for WRM and give a better indication of the potential for recovering costs from user (Box 3.2).

Box 3.2. Benefits of WRM in Ghana

The case study identified the benefit from investment in water and sanitation and links it to Ghana's set of development targets. The case study recognises the importance of integrated water resource management to promote cooperation in national and shared water basins for the mutual benefit of all water users and their communities. This would provide opportunities for regional cooperation, development and integration at the international level to the benefit of all riparian states. Benefits would also accrue from the prevention, mitigation and management of water related disasters. Ghana has recognised that WRM extends across a wide range of beneficiaries and that policies must cope with the steady growth of population and urbanisation which increases demands on finite resources. Meeting the rapidly growing and diversified demands implies balancing water for domestic use, irrigation, hydropower generation, industrial processes, fisheries and aquatic ecosystem protection.
(Asante and Boakye, Ghana case study, 2011, p 11)

Quantifying the economic benefits of WRM is still at an early stage in all countries. Methodologies are only now being developed. For example, in the European Union (EU), the Water Framework Directive requires an economic analysis to be undertaken if countries want to postpone meeting targets. It is notable that the case studies did not identify benefits uniquely for WRM, but grouped them with those from improved water services – the latter being the highest priority in most African countries.

Table 3.1 is taken from the Uganda study and summarises the national benefits from better WRM and service provision. Uganda recognises that water contributes to the achievements of all the national development goals, but the role of WRM is more diffused in uplifting standards of living of households.

Table 3.1. Linkages between national objectives and key sector priorities

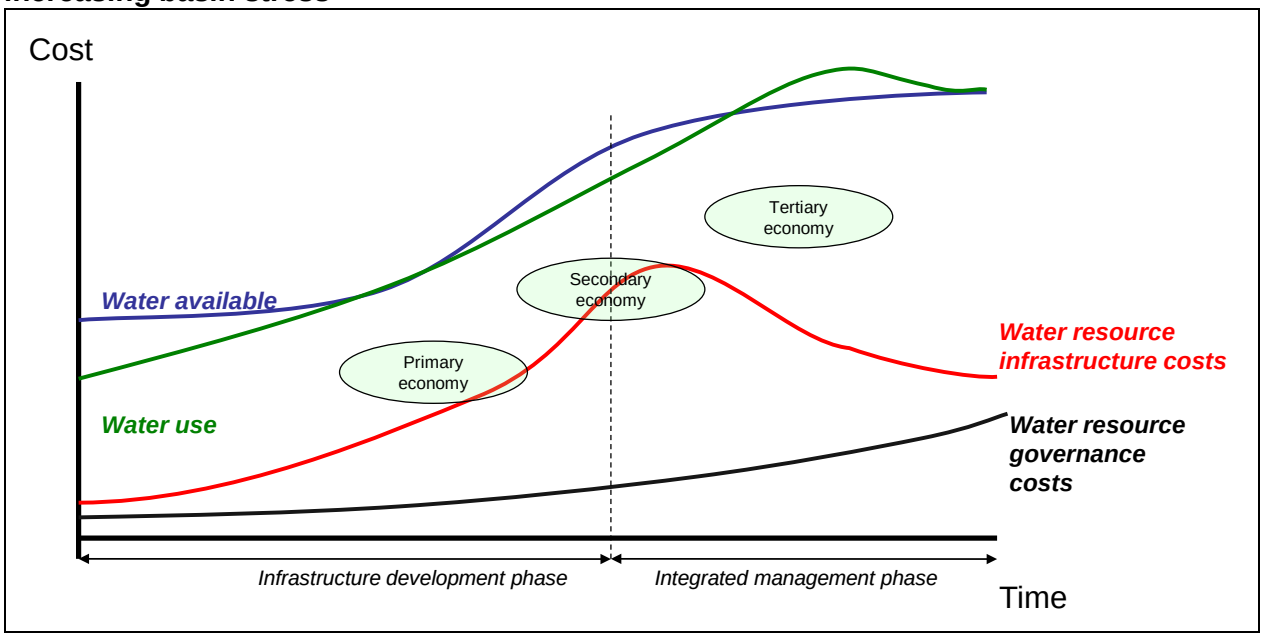
National objective	Sector objectives and priorities
1. Uplift household standards of living	Provision of sustainable safe WS&S facilities, including hygienic use in rural areas
	Provision of viable urban WS&S for domestic, industrial and commercial uses
	Healthy living conditions for all Ugandans in both urban and rural areas
2. Enhance the quality and availability of gainful employment	Provision of viable urban WS&S for domestic, industrial and commercial uses
	Provision and effective use of water for agricultural production (including crop irrigation, livestock and aquaculture), rural industries, hydropower and tourism
	Integrated and sustainable management of water resources
3. Improve social, economic and trade infrastructure nationwide	Provision of viable urban WS&S for domestic, industrial and commercial uses
	Provision and effective use of water for agricultural production (including crop irrigation, livestock and aquaculture), rural industries, hydropower and tourism
	Integrated and sustainable management of water resources
4. Develop efficient, innovative and internationally competitive industries	Provision of viable urban WS&S for domestic, industrial and commercial uses
	Provision and effective use of water for crop irrigation, livestock and aquaculture, rural industries, hydropower and tourism
	Integrated and sustainable management of water resources
5. Develop and optimally exploit the national resource base and ensure environmental and economic sustainability	Integrated and sustainable management of water resources
	Healthy living conditions for all Ugandans in both urban and rural areas
6. Strengthen good governance and improve human security	Integrated and sustainable WRM

The South Africa case study recognises that the level of water infrastructure development over the last 50 years has been a significant factor in economic growth and that this growth has facilitated water development in a virtuous circle. South Africa has the highest level of water storage per capita in Africa (even though it is modest compared with the developed world). The benefits from storage have enabled the country to move from primary production to secondary sectors, such as manufacturing. Urban and industrial users have been the biggest beneficiaries, with growth in the commercial economy. Conversely, the country has experienced the negative consequences of cycles of floods and droughts and growing water stress and deteriorating water quality because of these growth sectors – demonstrating the importance of an integrated approach. Studies on waste discharge indicate that the effects of poor water quality may reduce GDP by 1%. This has shifted the focus over the last twenty years towards the social needs of the poor with policy and legislative reforms following the broad principles of IWRM.

While there is little empirical data on the direct contribution of WRM to national economic and social goals, it is clear that in South Africa at least, which is vulnerable to droughts and floods, most of these goals are dependent on effective WRM. The rising relative importance of WRM over time is depicted schematically in Figure 3.1, which plots water resources

infrastructure and governance costs against the increasing development and management of a hypothetical basin's water resources. (The terms *primary, secondary and tertiary* in relation to the economy's structure refer, respectively, to its relative dependence on primary commodity production, manufacturing or advanced processing, and the provision of services.)

Figure 3.1. Variation in water resource governance and infrastructure costs with increasing basin stress



4. Financing WRM in theory

Water as a topic is diverse and diffuse, and a variety of agencies are involved in its governance, management and financing. Many water financing systems have evolved in an ad hoc *pragmatic fashion, responding to political, bureaucratic, and legal pressures, as much as to objective, 'rational' criteria. The systems that result from this process are far from ideal, and can sell WRM short.*

An approach based on 'principled pragmatism' has a good chance of succeeding. There is a growing consensus around the '3Ts' approach, which starts by building up the cash flow of a project from tariff revenues, budgetary allocations and external transfers from official development assistance (ODA), and using this to leverage commercial sources of finance. The well-known and accepted principles of User Pays and Polluter Pays apply. The basic distinction between public and private goods can also guide financing, though these are not watertight categories.

State budgets and external ODA make up the main sources of financing for WRM and other water investments. Cost recovery from users is modest and only important for water supply. South Africa uses a wider range of financing sources operating at various levels and stages of the water cycle, with higher recovery from users and beneficiaries.

4.1. An international perspective[2]

Viewed as an environmental medium 'water' is diverse and diffuse, and this is reflected in the variety of institutions involved in its governance, the types of finance it draws on and their respective sources. This makes it difficult for a central authority to set principles for financial allocation and ensure their even application across all the activities entailed in water management and use. At best, such an authority would have full jurisdiction over only a part of the water domain, such as those functions and services dependent on grants from the central budget, loans from publicly owned financial institutions and public guarantees for loans and bond issues by sub-sovereign agencies.

It is rare to find a 'Ministry of Water' dealing with all aspects of this topic. It is more common to have separate ministries responsible for water resources, irrigation, environment, power, transport, health, urban water supply, rural water, and so on. Each of these subject areas impinges on water, yet each typically has separate ministerial responsibility and administrative structures, with financing in one area determined independently of the others.

A further complication is that much public finance going into water comes from autonomous agencies and external sources. Public finance is itself only part of the funding jigsaw, with substantial sums originating from commercial financial bodies and the water users themselves. Many financing decisions are taken at a delegated level. To add to the complexity, some funding relevant to WRM comes from the budgets of other ministries, particularly agriculture (for instance a number of measures in the EU's Common Agricultural Policy have a major impact on water resources).

The different segments and layers that we refer to as 'water' are inter-dependent hydrologically and financially. Deficiencies in any one layer caused by financing difficulties will very soon have an impact on other water functions and services. The institutional structure in some countries prevents any clear distinction between water resources *management* and their *development.* This is as true for developed as much as for developing countries, as highlighted at the OECD Expert Meeting.

Many water financing 'systems' have evolved in a pragmatic fashion, with major institutional reforms and innovations arising either from crises or blatant deficiencies in existing systems. However, there are countries which take a more *principled* attitude towards water financing, seeking greater coherence in the system and conformity with national strategic aims. Within the EU, France and the Netherlands are clear examples, and elsewhere South Africa has also developed coherent financing principles and practices. The search for policy excellence must recognise that there are many 'models' of water financing, reflecting the variety of institutions and governance of water in different countries.

Public financing for water can take various forms:

- Allocations from the annual budget of grants for recurrent and capital items entailed in developing or managing water-related assets
- Loans for infrastructure development from governments, autonomous public infrastructure funds or publicly owned development banks
- External finance channelled through, or allocated at the discretion of, central government, e.g. ODA, loans from IFIs, EU grants

[2] This section draws on material prepared for the OECD Expert Meeting on Water Economics and Financing, Paris in March 2010.

- Public guarantees for commercial loans or private equity (various kinds of 'off balance sheet' finance, such as financial guarantees, off-taker agreements, etc., which are a contingent liability for the national exchequer)
- Subsidies targeted at water users or specific service providers, including the encouragement of *in-kind* and *self-funding* initiatives.

These five categories of finance criss-cross the various water domains. Governance is typically funded largely or wholly from government budgetary grants. At the other extreme, water user services tend to recover a portion of their costs from consumers, with the balance made up from government subventions or targeted consumer subsidies. The stewardship aspect of WRM and development shows great variety in its forms of finance, with many hybrids and combinations.

In many developed countries the cost of water services and, sometimes, environmental and resource costs are fully recovered from water users. In such cases, public finance has a more limited role in the water sector, mainly confined to the provision of public goods and administrative overheads. In England and Wales all the costs of water supply and wastewater are recovered in the prices charged. This leaves the Environment Agency, which drawing its funds from central and local governments, with some limited cost recovery from specific beneficiaries, the responsibility for much of WRM.

Many countries make subsidies available for capital investment (grants or concessional loans) for projects advancing national social and economic objectives, which may include benefit-cost or cost-effectiveness thresholds. It is also common to find stated criteria for the allocation of external finance (ODA, IFI loans, regional grants) to the water sector, where this is a priority sector in a national programme of cooperation. This external finance is commonly offered in a country framework agreement which, in principle, reflects the priorities of both the host government and the funding agency. For poorer countries, external finance can be the largest source of investment capital for water infrastructure, Hence, the criteria used by external agencies can be paramount. Loans from the European Investment Bank (EIB) have been a major source of funding for water and wastewater projects within the EU and its neighbours, and countries covered by its wider lending mandates[3].

International and inter-regional water resource organisations fund WRM through various *ad hoc* devices. For instance, the Organisation pour la Mise en Valeur de fleuve Sénégal (OMVS) (for the River Senegal) is funded by loans and grants from its regional member states, with management and governance functions wrapped into hard infrastructure development from the funding point of view. The Commission Intérnationale du Bassin Congo-Oubangi-Sangha (for the Congo Basin) is funded from a 1% levy on import duties from the regional members.

In summary, the processes actually used in allocating funding for water respond to several basic forces, the balance of which varies between countries:

i) Political - the interaction between urban and rural, industrial and agricultural, tribal and regional groups
ii) Bureaucratic and administrative procedures, incorporating formal criteria
iii) Legal compliance (particularly where international agreements apply, Lesotho Highlands, OMVS)

[3] National governments typically treat this as 'off budget' finance, not subject to approval as part of the annual budget processes.

iv) Democratic processes of consultation between stakeholders (as in France and the Netherlands and becoming more common in Africa)
v) Use of 'technocratic' economic decision rules, such as cost-effectiveness and cost-benefit analysis (as in the UK Environment Agency for flood risk management), and in the use of the disproportionate cost criterion (in the implementation of the EU's Water Framework Directive).

The patterns of water financing summarised above leave much to be desired. First, and most basically, systems can fail to generate sufficient funds for WRM and for water more generally. The quest for a more 'rational' or 'optimal' allocation of public finance across the water sector is hampered by the segmentation of the sector, the use of different criteria within each segment and the existence of *privileged enclaves* and also *neglected orphans* within these segments. Common examples are:

- The near-universal habit of subsidising capital investment rather than maintenance or operational costs
- The neglect of maintenance
- Preference for water supply over sanitation and domestic hygiene
- Neglect (until recently) of sewerage and wastewater treatment
- Priority of urban over rural needs
- Preference for 'hard' over 'soft' solutions for flood risk management
- Catchment protection
- Drought mitigation.

Greater evenness and consistency in the application of the criteria for the use of public financial support[4] would help to remove the worst of these discrepancies, and identify the most blatant cases of over- and under-funding[5]. The criteria used should be aligned with the aims of the national water strategy. In practice, not all countries have an explicit and coherent water strategy and some strategic aims are too vague to be the basis of policy.

Although the allocation of public finance for water will always be a political process, it can be guided by rational and explicit decision criteria. Interventions to be supported should be cost effective and cost-beneficial and should consider alternative, and complementary, approaches e.g. between demand management and supply orientation options, 'hard' and 'soft' measures and different service standards.

4.2. Principles applicable to the finance of WRM

In Africa, financial investment of about USD 20 billion per year is required in the entire water sector according to the Africa Water Vision 2025. The need to finance resilience to climate change will add to the financial burden facing many countries. The variety of functions covered by WRM makes it difficult to offer a set of financial rules suiting all cases. Instead, an approach based on 'principled pragmatism' is the best that can be hoped for and that each country has a 'financing system', even if it is not well articulated. The sources of finance can be broken down into the '3Ts': tariffs and other user charges, tax revenues rechanneled through government budgets, or transfers of grants and soft loans from external

[4] Both direct (grants, loans) and indirect (guarantees, approvals)
[5] In many poor countries a high proportion of the national water budget goes into subsidising the financial deficits of water services in major cities.

donor agencies or philanthropic funds[6]. Countries differ in the relative weights of these sources as applied to WRM. The 3Ts make up the flow of basic revenues available to leverage commercial (repayable) finance in the form of loans, bonds and equity.

In the absence of a universally recognised and practised 'water financing model', finding money for WRM is more of an art than a science and is governed by political pragmatism. Nevertheless, there is a sound basis for the following basic principles:

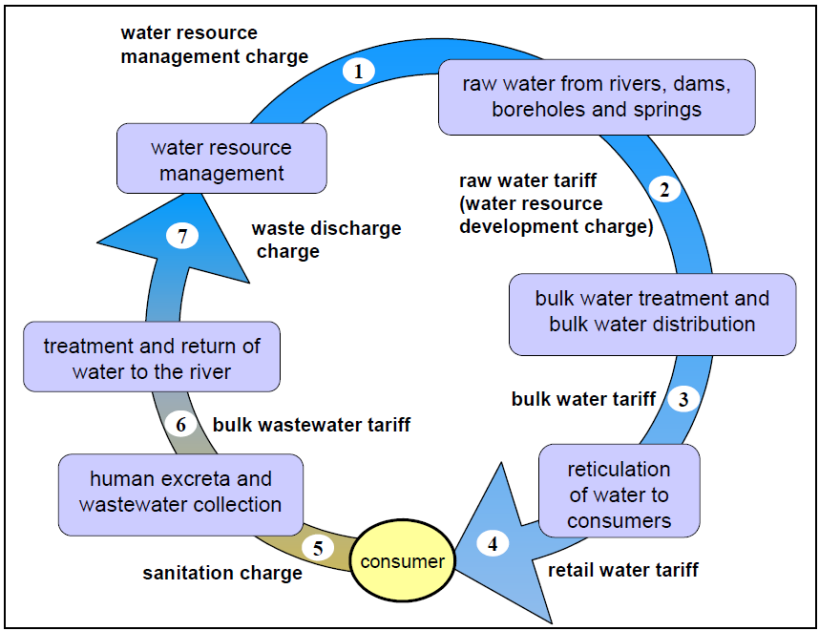
- The amount of sustainable investment and recurrent spending on WRM is governed by, and limited to, what can be supported by the 3Ts. In the long term, commercial finance is not a substitute for the 3Ts, though it is a rational way of funding investment if kept within affordable limits
- In WRM the initiative for providing public goods normally needs to be taken by public agencies and financed from public sources. That said, work can be delegated to private agencies which are rewarded in various ways. For example, private companies can build and operate freshwater and wastewater treatment plants under BOT or BOOT[7] contracts. Private farmers can be paid for providing environmental services in water catchment areas (e.g. abstaining from the use of chemical products, preserving woodland, keeping livestock away from water courses, etc.). In such cases, private agents are being paid for the provision of public goods
- The supply of private goods and services can, in principle, be financed through charges levied on their users. The fact that many such private goods (e.g. household water, irrigation services) are provided and financed by public agencies qualifies, but does not invalidate, this principle. Financing based on water users' and beneficiaries' contributions is likely to be more sustainable than financing that relies heavily on external transfers
- The 'polluter pays' and 'user pays' principles are now widely (though not universally) accepted as justification for pollution charges and water service payments, respectively. However, these principles are not yet extensively applied.

The precept that 'water pays for water' has proved to be, broadly, a fair, acceptable and sustainable solution in some European countries. However, the conditions for producing the circularity of revenues to match the full costs of WRM do not exist in many cases. South Africa also has a coherent system of water pricing, working at different stages of the water cycle and serving clearly articulated national policy aims (see Figure 4.1). However, Ghana and Uganda do not show similar coherence.

[6] OECD, Managing Water for All: An OECD perspective on pricing and financing, 2009 and EUWI-FWG, Strategic Financial Planning for water supply and sanitation in Africa, May 2010.

[7] Build, operate, transfer and Build, own, operate, transfer contracts, giving the contractor the concession for collecting revenues from the project, in return for providing the initial financing and building the facility. There is an obligation to transfer the asset back to the public client at the end of the contract period.

Figure 4.1. South Africa: water pricing chain linking water resources and water services



(Strategic Framework for Water Services, 2005)

In preparing a national water policy, Zambia has drawn up the following principles for financing WRM:

- Recover costs from users for directly productive services and increase self-financing of service providers
- Use public finance for public goods
- Make full use of external grants and loans
- Co-finance international water projects on the basis of equitable benefits
- Ensure the cost of multi-purpose schemes are shared between sectors
- Tap finance from commercial sources and negotiate PPP for new sources.

Other principles, though well founded in theoretical best practice, are often overturned on pragmatic grounds. For instance, cross-subsidising some water users by over-charging others is widely practised, even though it may distort consumers' behaviour. Likewise, revenues raised from charges and taxes on water users – including polluters – may be *earmarked* for spending within the same sector[8], even though this complicates the task of national fiscal management. Some countries strike a distinction between charges for services, which are allowed to be retained by the provider agency, and taxes and penalties, which have to be returned to the government for general purposes. Retaining revenues within the sector is very important if adequate finance is to be raised.

[8] Some countries make a distinction between charges for services, which are allowed to be retained by the provider agency, and taxes and penalties, which have to be returned to the government for general purposes.

5. African practice of WRM financing

This section reviews the experiences described in the case studies, following the template in Table 5.1 which divides WRM into the three major components of governance, stewardship and infrastructure, and the four financing sources of user charges, state budgets, ODA and commercial funding. This section outlines the findings of the three case studies and there are differences in approach. The findings are presented independently for each country and no attempt has been made to put them on a similar or comparative basis as the countries vary considerably. The aim is to illustrate the reality rather than to analyse and compare countries.

Table 5.1 Financing modalities for WRM and development

WRM category	User charge	State budget	ODA	Commercial and repayable sources
Governance	Water resource management charge; sale of by-products or services (e.g. timber, fishing, recreation, information, hydrological data)	Major source	Some bilateral ODA for specific functions	Not generally applicable. Potential in some countries for national or municipal bond issues for water
Stewardship	Abstraction charge; pollution charge; flood protection levy	Major source (including budgets of agriculture, environment, etc.)	Available for projects and capacity building	Loans and equity through concessions (BOTs, BOOTs etc.) for wastewater projects, desalination
infrastructure	Tariff for sale of 'private' goods and services	Subsidies, soft loans, guarantees	ODA grants for 'social' purposes	IFI loans; non-OECD lending; equity; bond issues; PPPs

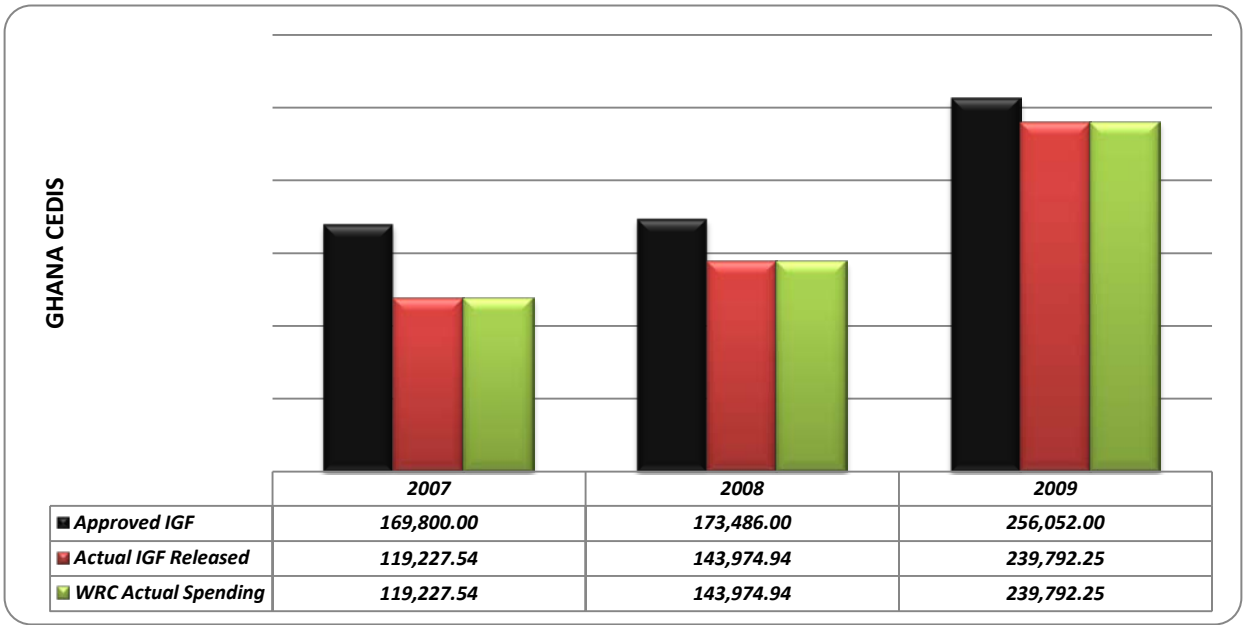
5.1. Financing of governance

User charges

In Ghana[9], internally generated funds (IGFs) from the Water Resources Commission (WRC) have always exceeded government budgetary approvals and actual releases. The IGFs come from four main sources – administration fees, application fees, raw water abstraction fees and drillers' licensing fees (Fig. 5.2 and Table 5.2).

[9] Ankomah Asante and Asuming Boakye, *Financing water resources management. Nov 2011*

Figure 5.2. The internally generated funds (IGF) of the Water Resources Commission (WRC), in Ghana Cedi (GHS), 2007-2009



(Ghana case study, 2011).

Table 5.2. Internally generated funds of the Water Resources Commission, 2007-2009 (GHS)

	2007	2008	2009
Administration fees	5,600	11,060	22,640
Application fees	710	1,665	1,020
Raw water abstraction fees	189,886	257,051	340,637
Drillers' licensing fees		9,500	23,510
Total (see note)	**198,203**	**281,284**	**389,816**

(Ghana case study, 2011. Note: Part of the IGF is always retained i.e. not all of the IGF is released for spending by the WRC. This explains the difference between the IGF and/or the released and total IGF realised.)

In South Africa[10], the WRM charge was introduced to recover the governance costs in a basin, including, but not limited to:

- Planning and implementing catchment management strategies
- Monitoring and assessing water resource availability and use
- Water use allocations
- Water quantity management, including flood and drought management, water distribution, control over abstraction, storage and stream flow reduction activities
- Water resource protection, resource quality management and water pollution control
- Water conservation and demand management

[10] Pegram and Schreiner, *Financing water resource management: the South African experience.* Pegasys, 2009

- Institutional development and enabling the public to participate in WRM decision-making.

Under the 1999 Pricing Strategy this WRM charge applied to consumptive water uses, namely abstraction, storage (losses) and streamflow reduction activities (commercial afforestation), but in 2007 it was expanded to include waste discharge. A policy decision was made to apply a single charge to all users within each sector (urban-industrial, agricultural and forestry) in a water management area. Subsidy mechanisms have been developed to waive the charges for emerging black farmers for a specified duration.

The implementation of WRM charges to all legally registered users in the country required the registration and billing of more than 60,000 customers with about 80,000 water uses. However, less than 20% of the customers provide more than 80% of the revenues. Registering users, maintaining the data base, billing according to water use and recovering costs needs serious technical, managerial and financial resources from the Department of Water Affairs (DWA), linked to the establishment of the water resources national register and billing systems.

Weaknesses in the execution of WRM in some water management areas accounts for the low rates of payment of the WRM charges. Of the ZAR (South Africa Rand) 150 million in WRM charges invoiced in 2008/09, only about 50% seems to have been recovered by DWA, although weak financial management prevents accurate estimation. In some cases, farmer groups have deposited the charges into trust funds, stating that these would only be paid once DWA demonstrates delivery of the functions being billed for, including timely authorisation of license applications and control/enforcement of water use.

The key lesson to be drawn from implementation of the WRM charge is the importance of engaging customers in the process of setting charges and the need to demonstrate the benefits of the functions being charged for. The latter has been hampered by delays in the implementation of Catchment Management Agencies (CMAs).

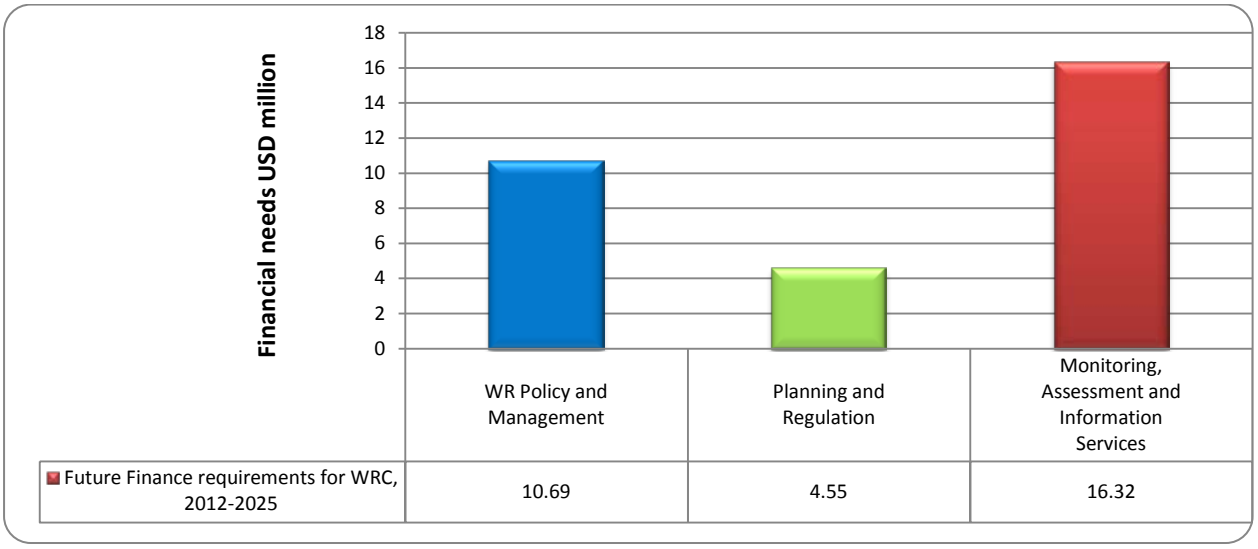
South Africa also has a Water Research Levy. Since 1984, water research levies have been charged on urban, industrial and irrigation water from government water schemes to support research by the Water Research Commission. The ZAR 127 million received in 2008/09 was collected from the ZAR 0.354/m^3 levy (relevant from July 2008), which is indexed to inflation. South Africa's lead role in water policy development and its implementation is due in no small part to the ring-fencing of the Water Research Commission's long term research programmes from short-term budgetary imperatives.

State budget

In Ghana since 2007, there has been a progressive reduction in government budgetary allocations to the WRC from GHS 94,500 in 2007 to GHS 60,845 in 2009. Actual releases by the government have been even lower than these nominal allocations – in 2007, releases were only 6% of allocation, in 2008 11.8% and in 2009 3.3%. Not surprisingly, the WRC has always used all funds actually released.

Financial requirements for future *water resources management* in Ghana between 2012 and 2025 have been categorized into three themes – Water Resources Policy and Management, Planning and Regulation and Monitoring, Assessment and Information Services. The proportions of the total WRM budget to be taken by the three components are, respectively, 33.9%, 51.7% and 14.4% (Figure 5.3).

Figure 5.3. Future WRM requirements in Ghana, 2012 – 2025



(Ghana case study, 2011.USD 1.0 = GHS 1.1)

In Ghana, the greatest constraint on water development is lack of financial resources. This is manifested in inadequate funding and inefficiency in spending decisions. The volume of financial support to institutions of WRM and service delivery, such as the Ghana Water Company Limited and the Community Water and Sanitation Agency, so far falls short of the desired levels. Government budgetary approval for the WRC was GHS 94,500 in 2007, GHS 67,437 in 2008 and GHS 60,845 in 2009 (see Table 5.3). However, actual releases were only GHS 6,043.47 (2007), GHS 7,935.88 (2008) and GHS 1,996.86 (2009).

Table 5.3. Breakdown of the approved budget for the WRC (GHS), 2007- 2009

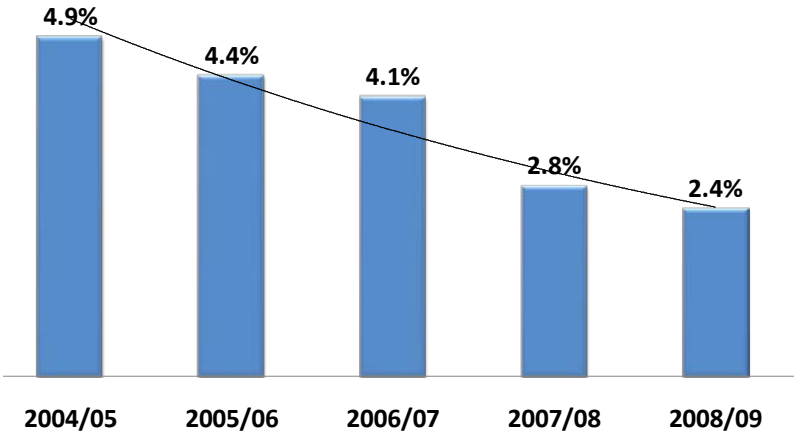
	2007	2008	2009
Personnel emoluments	53,593.21	38,245.13	34,506.65
Administration	11,846.54	8,453.92	7,627.55
Services	6,260.47	4,467.59	4,030.88
Investment	22,799.78	16,270.36	14,679.92
Total approved budget	**94,500.00**	**67,437.00**	**60,845.00**
Actual releases	**6,043.47**	**7,935.88**	**1,996.86**

(Ghana case study, 2011)

On average, investment levels for WRM (with the WRC at the fore front) in Ghana have been much less than desired as can be seen by comparing the WRC budget and the government budgetary approvals with the eventual releases. For example, in 2008 from a GHS 291,296.00 budget estimate, only GHS 94,500.00 was approved and a paltry GHS 6,043.47 (6%) was released. Of the total GHS 206,272.00 WRC budget estimate for 2009, only GHS 60,845.00 was approved and as little as GHS 1,996.86 (3%) was released. Despite the positive contribution to, as well as the importance of, water in Ghana's development plans, the government's commitment to WRM remains poorly understood or neglected. This is reflected in the government consistently meeting less than 15% of the total budget on an annual basis. The low release of funds committed is a critical problem for effective WRM.

In Uganda[11] financing for WRM falls within the overall financing for the water sector. The share of this in the national budget has declined over the last 5 years – from 4.9% in financial year 2004/05 to 2.4% in 2008/9 (Figure 5.4). This loss of priority occurs despite concerns that funding levels are insufficient to meet the national Poverty Eradication Action Plan targets. Furthermore, because of national budget ceilings, ODA through earmarked budget support is not always translated into additional funds for the water sector.

Figure 5.4. Water and sanitation finance, including WRM, as a proportion of the national budgets 2004/5 to 2008/9 (%)

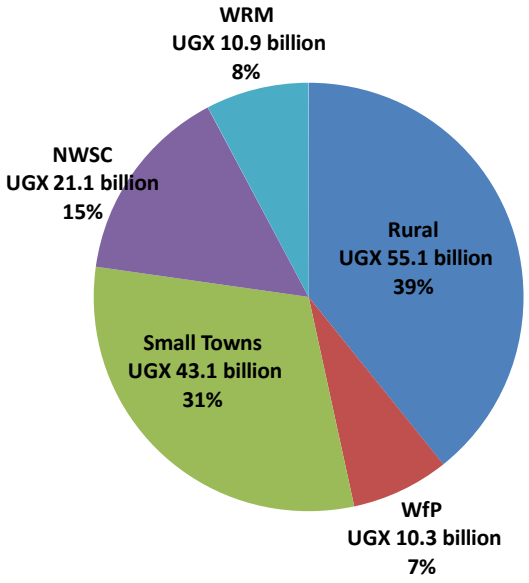
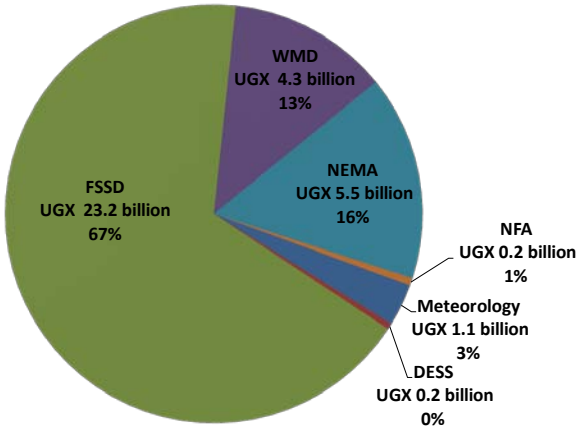


Of the total UGX (Uganda Shilling) 184 billion allocated to the Water and Environment Sector in 2008/9, The Government of Uganda (GoU) approved funding was UGX 110 billion (60%), while donor funding was UGX 74 billion (40%). Of the UGX 184 billion, UGX 14 billion (8%) was for recurrent and UGX 170 billion (92%) was for development activities. This is broken down as follows (see also Figure 5.5):

- UGX 9.0 billion (5% of the total Water and Environment sector budget) was allocated to Finance and Administration
- UGX 140.5 billion (76% of the total sector budget) was allocated to the Water and Sanitation sub-sector, which includes WRM – budgeted at only UGX 10.9 billion (8%)
- UGX 34.4 billion (19%) was for the Environment and Natural Resources sub-sector.

[11] Directorate of Water Resources Management, *Financing water resources management: An analysis of how financing of water resources management takes place, current experiences and emerging challenges in Uganda,* 2010.

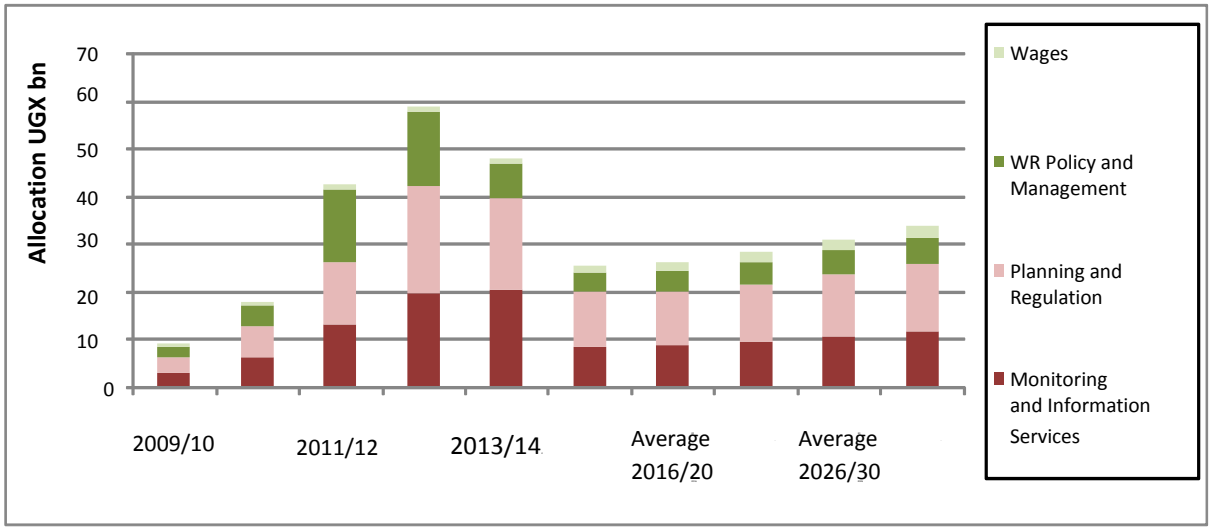
Figure 5.5. Breakdown of budget allocations within the water and environment (2008/9)

Water and sanitation sub-sector UGX 140.5 billion	Environment and natural resources sub-sector UGX 34.4 billion
	
WRM: Water Resources Management NWSC: National Water and Sewerage Corporation Rural: Rural WS&S Small Towns: Small towns' WS&S WfP: Water for production	FSSD: Forestry Services Support Department WMD: Wetlands Management Department NEMA: National Environmental Management Authority NFA: National Forestry Authority Meteorology: Department of Meteorology DESS: Department of Environmental Services

(Uganda case study, 2010)

The future financial requirements for WRM to the year 2035 were estimated in 2009 by the Strategic Investment Plan (SIP) for the WS&S sub-sector. The SIP provided detailed budgets and plans for the period 2009-2014 to achieve national targets. For the years after 2015 the estimates are based on a 2% annual increase for the recurrent activities that are related to increases in water use and activities in the water sector, while the funding for other activities remain constant. The total budget requirements to implement the SIP over the period 2009-2015, as well as the costs for the entire planning horizon 2009-2035 are shown in Figure 5.6.

Figure 5.6. Summary of future total WRM requirements – 2009 to 2035



The allocations of financial resources for all sectors, including WRM, are subject to nationwide allocations under the Water and Environment government budget ceiling. Considering the importance of WRM for the sustainable development of water services and the general economic development of the country, the SIP recommended that allocations to the WRM sub-sector should be given the highest priority in the funding allocations within the water sector.

In South Africa, the water resources governance function is taken to include the non-infrastructure related activities required to manage water resources. The formal expenditure is primarily through the national government DWA and its agencies, although there is significant, albeit not quantified, expenditure by local government and the private sector.

Table 5.4 presents an indicative summary of the water resources governance expenditure in South Africa over the last decade since the 1998 National Water Act (NWA) was promulgated, disaggregating it by the categories shown. The budget programme structure changed and collection of charges on the trading account was started during this period, so the figures are approximations based on the information in the DWA annual reports.

Table 5.4. Governance-related WRM costs (see below for description of each functional area)

Functional area	2008/09 (ZAR million)	2004/05 (ZAR million)	2000/01 (ZAR million)
Policy and planning (allocation and resource protection)	**210 (14.7%)**	210	120
Monitoring and information	**300 (21.1%)**	210	160
Research (WRC)	**105 (7.4%)**	75	65
Water use administration, control and enforcement	**600 (42.3%)**	300	200
Institutional development and stakeholder engagement	**45 (3.1%)**	20	10
Corporate, coordination and overheads	**160 (11.3%)**	105	80
Total WRM governance	**1,420**	**920**	**635**

(South Africa case study, 2010)

Key to 'functional areas' in table 5.4:
Policy and planning: includes the development of strategies, methods and instruments to implement the policy and legislation, as well as national water resources planning for reconciliation of supply and demand, including resources protection and water allocation; historically exclusively a DWA expenditure.
Monitoring and information: includes the creation and maintenance of water resources information systems to support the other functions, as well as the acquisition and sharing of monitored water resources related data; these figures are taken from DWA, but there is considerable obscured WRM expenditure in other government department and agency budgets.
Research: includes formal research in the water resources sector; much of this is funded by the Water Research Commission (these figures), but there are university, research institutions (Council for Scientific and Industrial Research) and foundation (National Research Foundation) research budgets for water resources that are difficult to assess (at least comparable amounts), not even including the private sector research into technologies.
Water use administration: includes activities for authorisation, control and enforcement, around the use of water resources, for abstraction, storage or waste discharge/disposal; historically this has been the responsibility of DWA, although water user associations/irrigation boards also play an important (but not quantified) role in control activities.
Institutional development and stakeholder engagement: involves the establishment, development and oversight of water management institutions, such as CMAs and water user associations, and the engagement and empowerment of stakeholders through this process; a new function being developed by DWA.
Corporate, coordination and overheads: involves the management, coordination and liaison functions required for WRM at the local, catchment, provincial, national and international levels; primarily a DWA function, but also with the involvement of the other parties.

These governance costs have increased in real terms over the past decade, as is to be expected in a country attempting to implement more integrated and coherent WRM in increasingly complex basins. The first part of this period involved active policy, strategy and instrument development to give effect to the NWA, which has more recently shifted to an implementation focus.

The concept of 'commissioning activities' was referred to during the first part of the period, noting that these were one-off activities required to develop instruments, create systems or establish institutions to support ongoing implementation. These activities related primarily to the policy, information and corporate categories, although the data is not complete. From a financial perspective, an important aspect of this commissioning process was the development of systems to support the water use management system and billing, which required significant resources; in excess of ZAR 100 million between 2000 and 2004.

In South Africa, spending on water resources governance, which includes the non-infrastructure related activities required to manage water resources, is primarily through the national government's DWA and its agencies, although there is a sizeable, albeit not quantified, expenditure by local government and private sector institutions.

Table 5.5 presents an indicative summary of the *water resources governance expenditures* in South Africa over the last decade since the 1998 National Water Act (NWA) was promulgated, disaggregating it by the categories shown. (It must be noted, however, that the budget programme structure changed during this period, so the figures are approximations based on the information in the DWA annual reports).

Table 5.5. Governance-related WRM expenditures

Functional area	**2008/09 (ZAR million)**	2004/05 (ZAR million)	2000/2001 (ZAR million)
Policy and planning (allocation and resource protection)	**210 (14.7%)**	210	120
Monitoring and information	**300 (21.1%)**	210	160
Research (WRC)	**105 (7.4%)**	75	65
Water use administration, control and enforcement	**600 (42.3%)**	300	200
Institutional development and stakeholder engagement	**45 (3.1%)**	20	10
Corporate, coordination and overheads	**160 (11.3%)**	105	80
Total WRM governance	**1,420**	**920**	**635**

(South Africa case study, 2010. USD 1 = ZAR 9.35 January 2009)

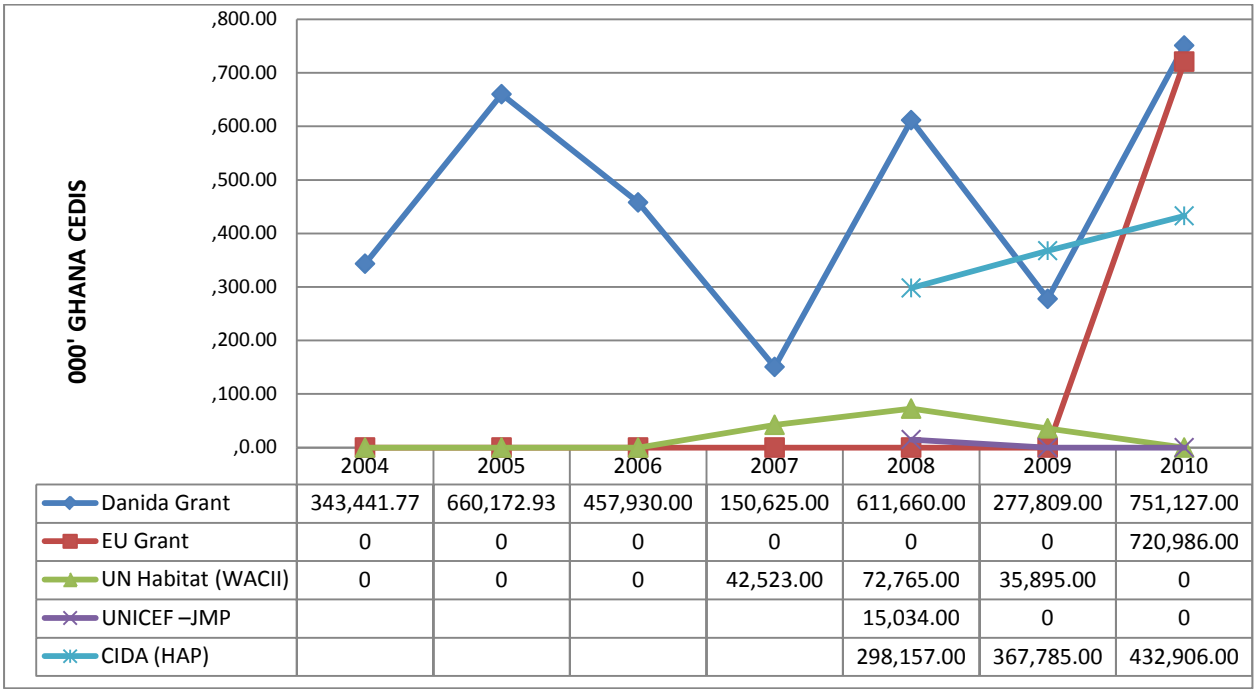
In judging the adequacy of budget allocations over the past 10 years, there are no good international benchmarks available, and in any case these would need to reflect the conditions and challenges faced in each specific situation. It might be expected that WRM in a water-stressed middle-income country with inequality and highly developed river basins, such as South Africa, would have increasing costs of WRM because of the complexity of governance and the high marginal costs of new infrastructure. Recent allocations are designed to make more effective use of the resources available, but the challenge remains to convert the spending into effective water resources governance and to ensure that infrastructure development serves social and ecological, as well as economic imperatives.

The case studies are the first attempt to get real information on financing WRM in African countries. The studies faced many obstacles and clearly more research is needed to get a better picture of financing WRM in Africa. For example, more in-depth study should make a clearer distinction between costs and revenues, assess the potential for cost savings as well as investment, and set out a more structured analytical framework. The aim should be to catch up with the sophistication of current knowledge on financing water supply.

Official development assistance

In Ghana, the main donors – CIDA, DANIDA, EU, UN-HABITAT and UNICEF Joint Monitoring Programme – have provided major support, in terms of grants, to the water resources commission. From 2004 to 2010, a total of GHS 5,238,816.70 was released to the WRC as grants from these donors. DANIDA contributed 62% of the total grants while CIDA contributed 21%. These funds have been used to strengthen capacity at all levels for WRM, e.g. enhancing the implementation of existing regulations on WRM and promoting scientific investigations and research in water resources assessment, management and development.

Figure 5.7. Ghana: trend in ODA for WRC



	2004	2005	2006	2007	2008	2009	2010
Danida Grant	343,441.77	660,172.93	457,930.00	150,625.00	611,660.00	277,809.00	751,127.00
EU Grant	0	0	0	0	0	0	720,986.00
UN Habitat (WACII)	0	0	0	42,523.00	72,765.00	35,895.00	0
UNICEF –JMP					15,034.00	0	0
CIDA (HAP)					298,157.00	367,785.00	432,906.00

(Ghana case study, 2011)

The government of Ghana follows a sector-wide approach (SWAp) to implement policies, plans and programmes in the water sector, which includes WRM as a sub-sector. This is to guarantee effective harmonisation in implementation and monitoring approaches, and reduce the overall cost of delivery of the plans and programmes.

In South Africa, ODA is regarded by the national Treasury as an official resource flow which is supplementary to the budget and is not viewed as replacement funding for normal revenue. ODA may take the form of grants (actual non-repayable funds), technical cooperation (in the form of expertise) and financial co-operation (loans or credit guarantees). The DWA receives direct funding through its Directorate for International Relations. The bulk of the ODA received by the DWA is in the form of grants from the European Commission, Ireland, Belgium and the Department for International Development (DFID), UK. Since 1996 a total committed ODA of ZAR 5.8 billion has been provided (with expected matching funds of ZAR 2.6 billion). Although the vast majority of these funds are directed towards WS&S services, a few examples of WRM exist.

In 1997, the Danish development agency (DANIDA) provided a grant of ZAR 25 million to assist in WRM and capacity building. In 1998, DFID provided a technical assistance grant of ZAR 5 million for a strategic assessment of water in catchments. DANIDA also provided a technical assistance grant of ZAR 35 million for strengthening stakeholder engagement in the establishment of CMAs. Some finance has been provided by donors for seed funding of demand management through local development institutions, such as the Development Bank of Southern Africa. There are opportunities for endowment funding or guarantees for funds that support small local infrastructure investments to meet social investments.

While the social challenges facing the water resources sub-sector in South Africa are significant there does not seem to have been a great deal of philanthropic support to this sector. Even though accessing information on these sources of financing is difficult, it seems that philanthropic financing has focused on the most basic needs of housing, education, health, water supply and information technology. Similarly in-kind contributions at a

community level tend to be focused on these basic needs rather than the secondary requirements of WRM. However, there has been some funding from large corporations and international NGOs around the rehabilitation of wetlands (e.g. Mondi Wetlands Project).

In Uganda no effort was made in the Strategic Investment Plan to estimate requirements for ODA as it is assumed that in future it will flow largely through the budget support finance mechanisms with the prerogative for allocation resting with the GoU.

The Programme for Infrastructure Development in Africa is one conceived for implementing a strategy to develop infrastructure on the regional and continental scales in various sectors, including water. The German government agencies (Kreditanstalt für Wiederaufbau (KfW) and Bundesministerium für Wirtschaftliche Zusammenarbeit (BMZ)) lead on water and sanitation. The European Commission and EIB are involved in the EU-Africa Infrastructure Trust Fund, amongst other 'platforms' and 'pools' for blending grant and loan finance from a number of sources. In future, the African Water Facility will also be devoting a substantial part of its resources to project preparation.

Commercial finance

Water governance does not readily lend itself to commercial finance, though there are cases in Africa of governments (Ghana and Kenya) and municipalities (Johannesburg) issuing bonds, some or all the proceeds of which have been earmarked for water purposes.

5.2. Financing stewardship

User charges

Uganda charges *fees* for applications for *permits for water abstraction and discharge*, and for the *laboratory analyses of water quality*. So far, these have yielded minor amounts of revenue, which have accrued to central government accounts.

South Africa operates *Water use licensing fees* and a license application fee of ZAR 114 has been in place for many years. This is a relatively insignificant income stream for DWA and does not reflect the full cost of evaluating the 100 to 200 water use license applications received every year (not including the current backlog of 1300). In real terms, the application fee has decreased by between 6% and 8% over the last decade.

South Africa also has a Waste discharge charge system (WDCS) under active consideration. In 2006, DWA proposed the WDCS to give effect to the polluter pays principle, targeting basins in which the water quality was deteriorating below agreed levels. It has not yet been implemented, but indications are that this will happen soon. The system was based on two distinct charges reflecting fundamentally different approaches to managing water quality problems.

First, the *mitigation charge* is a user charge to recover the costs of mitigation measures undertaken in the resource. It is intended for application where mitigation in the water resource provides an economically efficient option for supporting the achievement of water quality objectives in a catchment, in comparison with the costs of reducing effluent loads at source. It is calculated by simply apportioning the full financial cost of mitigation to dischargers according to their waste load.

Second, the *incentive charge* is designed to achieve an economically optimal use of the resource for the discharging or disposal of waste, by setting a charge at a level that seeks to change dischargers' behaviour and reduce the total waste load to a level that will enable

achievement of economically, socially and ecologically acceptable water quality objectives. This is calculated against an estimate of the marginal costs of treatment for all dischargers, setting this at a level that will cumulatively achieve adequate waste load reduction to meet the catchment water quality objectives.

A key challenge to the incentive charge is that, being a non-requited 'environmental tax', it needs an amendment to the clause in the NWA prohibiting a 'duty, tax or levy'. It also requires a Money Bill to be presented by the Minister of Finance to enable such a charge to be set by the Minister of Water Affairs. Importantly, revenue collected from imposition of the charge must return to the Treasury, potentially, to be disbursed against proposed business plans for water quality mitigation projects in that or neighbouring catchments (to achieve a 'double dividend' from the charge). However, establishment of the mitigation charge requires dischargers to commit to paying for the measure, at least until capital costs have been repaid, similar to the off-take agreements required for off-budget water supply infrastructure financing.

Furthermore, as with the implementation of the WRM charge system, an extensive registration process is required, supported by appropriate information management and billing systems for those catchments in which it is to be applied. An interesting development is that just the threat of implementing the WDCS has led to some industries and mines adopting cleaner technologies with significant costs for new developments.

A preliminary 2005 case study to address excess nutrients in the Hartebeespoort catchment downstream of Johannesburg and Pretoria, indicated incentive and/or mitigation charges of the order of ZAR 50 to ZAR 90 per kg of phosphate. This gave a projected revenue of between ZAR 10 million and ZAR 20 million, depending upon the way in which the incentive and mitigation charges were combined.

State budget

State budgets are a crucial source of funding for all three of the WRM components – governance, stewardship and infrastructure, and there is, as Chapter 2 pointed out, substantial overlap between each of these components in the way national budgets are allocated.

Taking a broader view, in South Africa the state budgetary allocation to WRM has stayed relatively stable as a proportion of the total water budget (at just below 60% – Table 5.6). However, the proportion of WRM in the total national budget has dropped over the past decade to about 0.5% as national priorities have shifted to social spending and an expanded public works programme. WRM spending has remained stable at about 0.15% of GDP. While WRM expenditure per capita has increased in real terms, the real per capita *recurrent* WRM budgets have stayed relatively constant over the past 10 years.

Table 5.6. South Africa: WRM expenditure compared to fiscal allocations (nominal)

	Financial year		
	2008/2009	**2004/05**	**2000/2001**
Total operational WRM budget (ZAR million)	**3,670**	**1,940**	**1,735**
Governance	1,420	920	635
Infrastructure recurrent	1,050	1,000	900
On-budget infrastructure	1,200	20	200
WRM budget as a proportion of the water budget (%)	57	60	58
Total water sector budget (ZAR billion)	6.5	3.3	3.0

WRM budget as a proportion of the RSA budget (%) Total RSA budget (ZAR billion)	0.47 784	0.53 369	0.75 234
WRM budget as a proportion of the RSA GDP (%) Total Republic of South Africa GDP (ZAR billion)	0.16 2,284	0.14 1,395	0.16 1,100
WRM budget per capita (ZAR) WRM recurrent budget per capita (ZAR)	75 50	41 41	39 34
Total RSA population (million)	49	47	45

(South Africa case study, 2010)

It is unclear whether these trends are likely to change dramatically over the next two decades, given the uncertain outcomes of the financial crisis for the South African government. The 2010-2014 DWA Strategic Plan indicates a 3% real increase in budget allocations to WRM in this period, largely driven by increased allocations to infrastructure and greater recognition of the needs of water resources compliance. This responds to current concerns about the availability and quality of water resources arising from several factors:

- The energy crisis arising from insufficient generating capacity
- The emerging recognition of water's importance as a catalyst or constraint on social and economic development (under the Water for Growth and Development programme)
- The delegation of responsibilities for implementing water services to local government.

Official development assistance

In Ghana, much of the funding of the WRC benefits water stewardship, both directly and indirectly. For example, it facilitates the development of bilateral and multilateral agreements/protocols to strengthen cooperation with riparian countries in shared basins, and develop and implement additional regulations on dam safety and effluent discharges.

As the earlier section noted, South Africa has not received much ODA for WRM, and private philanthropic funds have tended to favour water services, though there are several projects for the rehabilitation and protection of wetlands.

Commercial finance

South Africa has had considerable experience in using commercial sources of finance for infrastructure development, which is outlined here in some depth as this provides valuable lessons for other countries. The Trans-Caledon Tunnel Authority (TCTA) is a state-owned entity mandated to implement and fund raw bulk water infrastructure and empowered to raise funds from the domestic and international money markets. However, most such arrangements include public 'stewardship' functions as well as the supply of water to commercial users. The difficulty of disentangling these functions is illustrated by the following examples.

The first major off-budget financed water project for South Africa was the Lesotho Highlands Water Project. An important distinction between this and the later initiatives was that the South African government guaranteed the loan, which avoided the need for off-take agreements, long-term supply contracts with creditworthy customers and minimised the perceived investor risk associated with the intangible asset located in Lesotho. While the World Bank provided a small share of the capital, it had a disproportionate influence on the project development, as the *de facto* lead financial institution providing an umbrella of comfort for the commercial banks involved.

In order to manage its debt profile, the South African government did not want to guarantee loans. As a result, for all South African off-budget water resources debt since then, the national Treasury has avoided guaranteeing the loans. This has introduced the need for off-take agreements to underwrite the income stream against which the debt could be raised. Distinct observations around this process can be made from the recent experience of these projects.

The Berg River Project was delayed in its implementation beyond the planned commissioning date, because Cape Town resisted signing the off-take agreement, focusing rather on demand management measures that did not achieve the expected reductions. Conversely, off-take agreements for the Vaal River Augmentation Project were signed relatively expeditiously with the large corporate energy entities Eskom and Sasol.

The Olifants River Augmentation Project was first initiated to provide assured water supplies for the rapidly expanding platinum mining industry, with additional objectives being to supply poor rural communities (over a million people) in the region, as well as to maintain minimum environmental flows through national parks and cross-border flows to Mozambique. The initial funding proposals were designed to raise more than 50% of the construction capital by establishing purchasing agreements with the mines, with the remainder being funded from fiscal sources. This arrangement posed some institutional difficulties in the asset ownership between DWA and TCTA.

This water development had a six year lead time and the mining development was still at the stage where junior (prospecting and development) companies predominated. This complicated entering into the necessary long-term off-take arrangements, as these companies had no solid assets; therefore their guarantees would have been meaningless. As a result, the country's National Treasury agreed to provide the full investment cost of the project, to be recouped through full financial cost user charges, that the mining companies in the area have agreed to pay for water from this project should they need to expand production. In the interim, one mining company sought to establish a dedicated alternative supply, which would have prejudiced its competitors as well as reducing the viability of the public project. This illustrates the risks inherent in public infrastructure investment for private users without adequate assurance of long-term demand.

More recently, the proposed Mokolo-Crocodile Water Project to supply future thermal power generation and other coal mining projects in a water scarce area of Limpopo is planned for funding by TCTA. With a shifting energy policy, it is no longer clear that Eskom will be responsible for additional power stations in the area, as they may attract private operators. However, this means that Eskom is not prepared to sign off-take agreements beyond the first station's requirements, which in turn poses a problem for TCTA to finance the entire scheme.

In 2005 an evaluation was made about the possible institutional arrangements for infrastructure management in South Africa[12]. This led to the Cabinet agreeing to establish the National Water Resources Infrastructure Agency (NWRIA) as an amalgamation between TCTA and the DWA Infrastructure Management Branch. Key financial motivations for the NWRIA were to ensure appropriate ring-fencing of revenue towards operations, maintenance and refurbishment, and to enable general (non-project related) debt to be raised against the income stream associated with the existing water resources infrastructure assets. This would enable the institution to overcome the short-term constraints associated

[12] DWA, Institutional Options for Water Resources Management in South Africa, Pretoria, 2005

with requiring project based off-take agreements before off-budget funding could be raised for commercially driven infrastructure. Unfortunately, other political imperatives have shelved the establishment of the NWRIA and with it the possibility of addressing the project financing challenges.

5.3. Financing infrastructure

User charges

All countries covered by the case studies recover some costs of water supply from users, though there is a substantial degree of cross-subsidy and budgetary subsidy involved.

South Africa has the most developed systems for charging for water – the Water Resource Development Charge, the Bulk Water Tariff and the Bulk Wastewater Tariff – which are wholly or partly passed on to users. In 1996, the Cabinet decided that the price paid for water by major users should be raised over time to cover the full financial costs and to reflect its value to society. The planned new Water Act would need to enable this approach. However, as a result of the high levels of poverty and inequity in South Africa, a further principle in the White Paper was that the introduction of 'realistic pricing for water' should not penalise poor communities. It also states that where the full water price discourages the use of available water, provision may be made for some elements of the tariff to be suspended for a limited period of time. Income from water charges will be divided between operational agencies, water management authorities and the national government in accordance with their contributions and responsibilities.

The NWA, which gives legislative form to the White Paper, requires the development of a Raw Water Pricing Strategy. The preamble to the section on the Pricing Strategy outlines that it may differentiate between geographical areas, categories of water users, or individual water users and that the achievement of social equity is a key element of this differential approach. While enabling the setting of infrastructure, WRM and conservation charges, the Act also specifies that these may not be 'a tax, duty or levy', which limits the Pricing Strategy to addressing cost-recovery.

The first edition of the Pricing Strategy was published in 1999. The most recent Pricing Strategy (2007) contains the objectives, methodology and implementation strategy for setting water use charges for the purposes of:

- "Funding WRM by DWA and water management institutions, through water use charges
- Funding water resource development and the use of waterworks by DWA and water management institutions
- Achieving the equitable and efficient allocation of water, through a charge hereinafter referred to as the 'economic charge'.
- Providing for a differential rate for waste discharges[13]."

The revenue generated by the sale of water, as guided by the Pricing Strategy, serves to operate, maintain and refurbish state owned waterworks, most of which are operated and maintained by DWA, but some of which are funded by the TCTA which receives revenue from schemes which it has funded.

[13] DWAF, Establishment of a pricing strategy for water use charges in terms of section 56(1) of the National Water Act, 1998, Government Gazette No. 29697, I6 March 2007

State budget

For South Africa, in considering *water resources infrastructure expenditure* for supply purposes, a distinction should be made between capital and recurrent costs. The key agencies are the TCTA and the Komati Basin Water Authority, both bodies established for the funding and development of international infrastructure projects.

Over the past decade, DWA and TCTA have primarily developed large regional, national and international infrastructure, while local government, water user associations and private land owners have primarily developed local and micro infrastructure. This illustrates the difficulty of sharply distinguishing water resources infrastructure and water supply/services infrastructure, both at a regional scale where bulk supply schemes transfer large quantities of water between catchment areas and at the local scale in groundwater and rainwater harvesting systems.

Capital expenditure includes new construction, betterments to improve the yield of existing schemes and the rehabilitation-refurbishment of schemes experiencing operational deterioration (or inadequate maintenance). New construction may be on-budget through DWA or off-budget (using commercial finance) through TCTA.

Table 5.7 presents the valuation of the national water resources infrastructure assets owned by the national government (including TCTA). The major increase in the DWA asset value between 2000 and 2009 was largely a result of an asset revaluation (rather than new development), that assessed the current-day asset value in its existing state and compared this with the current replacement value of these assets (estimated to be about ZAR 130 billion in 2009). This revaluation had a major effect on the depreciation estimates on the DWA income statement, as well as infrastructure charges.

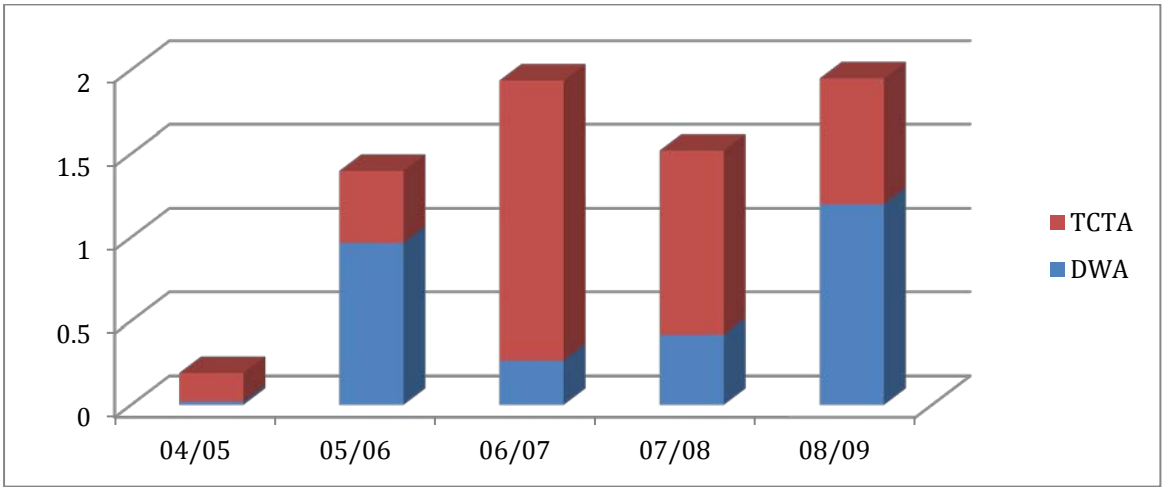
Table 5.7. South Africa: Water supply infrastructure costs (nominal values)

	2008/09	2004/05	2000/01
Infrastructure asset value ZAR billion) *DWA* *TCTA*	 **75** **19**	 40 15	 25 14
Capital additions (ZAR billion) *On-budget (DWA)* *Off-budget (TCTA)*	 **1.2** **0.75**	 0.02 0.17	 0.2
Ongoing annual expenditure (ZAR billion)	**1.05**	1.0	0.9

(South Africa case study, 2010)

However, DWA has built about ZAR 2 billion of new infrastructure and betterments since 2000, while about ZAR 3 billion was spent in the past four years on the refurbishment of infrastructure deemed to pose dam safety and operational risks. The increase of ZAR 3.5 billion in TCTA's asset value was a result of new construction during this period. Figure 5.8 shows the variation in capital expenditures for new infrastructure over the past five years, distinguishing between DWA and TCTA.

Figure 5.8. South Africa: Capital expenditure on infrastructure (ZAR billion) over the past 5 years (nominal values)



Recurrent operational expenditure consists of the fixed and variable costs associated with managing infrastructure, including the operation and maintenance of the schemes (including national TCTA projects) and national management, administration, planning, design and construction capacity. Recurrent spending on infrastructure has dropped in real terms over the past decade, even while the capital asset has increased and the infrastructure has aged.

While these figures include transfers for operation of the international Lesotho Highlands and Inkomati projects, they do not include the capital invested or the operational expenditures of the hundreds of schemes owned and/or operated by local governments and water boards for supply purposes, nor the thousands of small schemes and dams operated by water user associations, private land owners or communities. While these schemes may not have major asset values in comparison to the national infrastructure, they incur sizeable in-kind or monetary operational costs, which anecdotal evidence indicates may be in the same order of magnitude as that for national infrastructure.

Official Development Assistance

In Uganda, the Water and Sanitation sector has received substantial ODA for more than a decade. During this time there have been major improvements in the coverage of WS&S facilities and in the institutional structure and performance of this sector. Increasingly robust systems and approaches have been introduced into policy formulation, strategy development, planning, budgeting, financial control, technical supervision, monitoring and performance measurement, but there is still much room for improvement. Joint annual Sector Performance Review meetings, attended by a wide range of stakeholders, have been held since 2000 and provide an opportunity to reflect on past performance and recommend specific actions and undertakings.

These developments encouraged the GoU and its development partners (DPs) to move towards more aligned and harmonised modalities of cooperation. A new strategy evolved to make use of government systems as well as strengthening them from within. This also resulted in increasing harmonisation between DPs. In response, the GoU led a process to develop a Joint Water Supply and Sanitation Programme Support (JWSSPS) for the period 2008 to 2012 which combines assistance from a number of donors willing to pool their resources. These donors

included the African Development Bank (AfDB), Austria, Denmark, the EU, Germany and Sweden. The total value of the JWSSPS is approximately USD 150 million and its overall objective are *"To support the water and sanitation sector to improve its fiscal and physical effectiveness so as to efficiently achieve its targets and contribute to poverty eradication and better health for Ugandans."*

Commercial finance

Zambia has found that infrastructure, involving high capital investment, cannot be built without loans from international sources. This has traditionally meant from IFIs, but recently includes finance from sovereign wealth funds (e.g. Chinese, Indian, and Arab Funds). The latter often incur higher costs of borrowing and may include political conditionality, but they are simpler and quicker for countries to access finance. Many African countries are now turning to these non-traditional sources and the trend is likely to increase.

The bulk of water infrastructure investment is taken by government, but there has been no large investment project for 30 years. Pressures on the national budget for different purposes, means that public sector financing for WRM is not adequate and is unlikely to be so. The Government of Zambia (GoZ) recognises the need to increase public funding for WRM. Attracting private financing has been disappointing (e.g. for hydropower) because regulated electricity tariffs make it difficult for investors to achieve an acceptable rate of return on their investment. This reinforces the need for harmony between water and other sector policies.

The GoZ has found that creating autonomous entities (Special Purpose Vehicles) to take responsibility for WRM investment projects (e.g. Kafue River Hydro Authority, for hydro power, and the Devolution Trust Fund, for WS&S) has been effective in facilitating financing for large projects.

South Africa's experience with the TCTA, discussed above, is relevant in the context of infrastructure. TCTA has developed a strong relationship with potential investors, and its bond issues are well respected in financial circles, highly scored by ratings agencies and taken up by investors. Nevertheless, the relationship between TCTA and the government, in the form of DWA, contains the seeds of potential conflicts. In order to manage the risks of assets on its balance sheet and implement its high-profile off-budget projects, TCTA has created tensions with DWA, whose technical staff have felt the need to be more actively involved in the design and construction process. DWA's essential role is as a facilitator and regulator of off-budget infrastructure, and to play a directly active role in on-budget social infrastructure.

Locally, many municipalities and water user associations are not sufficiently creditworthy to raise private capital to implement projects, without government guarantees or support. In this context, the government's current financial constraints limit its willingness and ability to provide this support, except for emerging farmers.

6. Financing for trans-boundary WRM – a special case

For trans-boundary WRM, governance is normally funded by governments and international agencies, while infrastructure costs are recovered from users and beneficiaries in the partner countries. The current financial situation of most African Basin Organisations is characterised by irregular and unpredictable financial flows, insufficient funding and a dependency on external support agencies. Most of the African basin organisations only get half of the contributions that governments agreed to allocate to them. Investment funds from donors are important but are also irregular and often short term. It is therefore important to identify a mix of funding sources, which requires sound management systems. Constant political dialogue is needed focusing on measures with the biggest returns.

Providing finance for development and management of trans-boundary waters presents political, institutional and legal problems that are well documented. With increased water scarcity the difficulties of cooperation over trans-boundary waters may increase regional conflict and may stall economic growth. In Africa, 60% of the continent is covered by river basins and aquifers that are shared by two or more countries. Financing for the management and development of trans-boundary waters is a block on development for many countries in Africa, as many financing institutions cannot fund projects unless there is prior agreement between the riparian states.

Financing for trans-boundary water management (TWM) has two key elements:

- Financing for management functions, such as building regional/basin institutions, establishing goodwill between riparian states and negotiating agreements, developing capacities, data collection/information, coordination activities, etc. These are financed mostly from the annual budgets of the riparian states and donors can help with building this 'conducive environment'
- Financing infrastructure of varying types and purposes, which requires a package of financing from different sources including, where appropriate, from the private sector. However, the public good nature of many activities will limit private sector engagement to infrastructure that generates revenue (especially hydropower).

Government funds are critical and arrangements have to be made between riparian states to pay back loans. Public finance is needed for public goods and stewardship functions, and this will usually be on the critical path in most countries for many infrastructure projects. Donors can help to lever funds and facilitate the process of getting a package of funding, but not cover all the capital costs.

Donors have supported countries to set up basin management entities in various basins and encouraged dialogue to promote basin benefit sharing in various basins in Africa, the most well known being the Nile Basin initiative. This sought to achieve cooperation for the benefit of all riparian states by reducing upstream-downstream tensions and avoiding free rider problems.

However, after three decades, trans-boundary organisations are still at an infant stage and the institutional architecture is complex and dysfunctional. There has been little real

progress[14]. One positive step has been the adoption of an IWRM approach at the national level, which is an important ingredient for TWM negotiations.

Donors can provide strategic support, as in the Nile basin, Senegal River, Okavango and Volta, but ultimately governments have to come to agreement. The various benefit sharing initiatives have not so far broken the deadlock. There are many barriers facing banks and donors in supporting any TWM activity – a lack of demand, poor project preparation, a lack of bankable projects, political and commercial risks, governance issues, etc. However, the EU-Africa Infrastructure Trust Fund has already mobilised substantial sums for regional water projects and other types of infrastructure.

Most donor funding flows from government to government and the present instruments (General Budget Support, SWAps, Projects, etc.) present difficulties for regional development. Donors and IFIs may be unenthusiastic for TWM activity because of the difficulties of disbursement/repayment of loans, or, perhaps, by the way aid is measured by the Development Assistance Committee (DAC), etc. The use of different financing instruments, such as guarantees and others, for regional projects covering several countries may also present particular difficulties. The Regional Economic Communities (REC), such as SADC and ECOWAS, are critical and, together with donors, need to find innovative solutions to break the impasse on financing for TWM.

Cross border financing has higher project preparation costs, e.g. due to more complex management systems, an unwillingness to share data and lack of trust. The RECs and donors can play an important role in overcoming these constraints and in helping countries to access trust funds for preparing better projects. A key role is to stimulate investment by mitigating risk, but donors themselves are risk-averse when it comes to reputation and steer clear of large infrastructure projects. There is scope for more blending of grant, loan and private investments. Guarantee schemes should be used more by bilateral donors as they give investors the security that their investments will not be lost by events beyond their control (Box 6.1). One approach would be for donors to facilitate the establishment of *Special Purpose Vehicles* and commercial off-budget funding e.g. as in TCTA and the Kafue River Hydro Authority. The RECs can also argue the political and broader economic benefits rather than purely water matters.

Recently sovereign wealth funds (e.g. Chinese and Arab Funds), effectively ‘state owned private sector’, are actively financing major infrastructure in Africa. They will have an impact on TWM as they are more ready to fund infrastructure on shared waters without consideration for other riparian states. Whilst this will allow more rapid development of infrastructure, it could reduce trust between neighbours and increase the risk of conflict. The governments will also need to ensure social and environmental concerns are adequately addressed.

[14] Foster and Briceño-Garmendia, AICD report, 2009

Box 6.1. Kariba Dam (Zambia and Zimbabwe)

Kariba is one of the largest dams in Africa. Development for hydropower generation started in the late 1950s when Zambia and Zimbabwe were under colonial administration. It would be more difficult to develop such a project today requiring, as it would, agreement between two or more sovereign states. The Kariba stage 2 development in the 1970s was financed by a World Bank loan that was guaranteed by the British government. It would seem that the provision of such guarantees is a key role for bilateral donors. Guarantees are not however recognised as aid by the OECD-DAC which is a disincentive for donors to use this useful instrument.

The dam is administered by the Zambia Revenue Authority and is jointly owned by the governments of Zambia and Zimbabwe. Its annual budget is predominantly financed by the water tariff that was agreed in 1999. The tariff is structured to take account of the quantity of water used by the two power utilities (Zimbabwe Electricity Supply Authority and Zambia Energy Service Company). Other water users benefit from the dam and reservoir (e.g. fisheries, tourism), but are not charged. Energy is thus subsidising other uses.

In 2010 the Government of Zambia (GoZ) established a PPP with help from the International Finance Corporation for development of the USD 1.5 billion 600MW hydro project. A Special Purpose Vehicle will be formed to build and operate the scheme on behalf of the government, with the GoZ and the developer borrowing money on the open market.

(Source GWP Southern Africa, 2010)

Two generic types of trans-boundary management and associated institutions are relevant for southern Africa, namely:

- Basin authorities for joint infrastructure management, i.e. the Lesotho Highlands Development Authority (LHDA) for the Lesotho Highlands Water Project and Kobati Basin Water Authority (KOBWA) for the Inkomati Water projects
- Basin commissions/committees for cooperation around the management of trans-boundary water resources, i.e. the Orange-Senqu River Commission (ORASECOM) on the Orange, the Limpopo Water Course Commission on the Limpopo and the Joint Permanent Technical Committee on the Inkomati.

The former have been funded under the auspices of treaties between the countries benefiting from the infrastructure. In South Africa, KOBWA is funded from the DWA budget, while LHDA is funded from the raw water infrastructure charges paid by South African users. In addition to the operating costs, South Africa pays Lesotho a royalty for access to Lesotho water through the Lesotho Highlands Water Project.

In contrast, the basin commissions have historically been funded from the Treasury, either by in-kind contributions of time and resources by the riparian states in the case of committees, or by an agreed contribution of ZAR 500,000 per year from each of the parties to ORASECOM to cover core operating costs. Projects are funded on an *ad hoc* basis by one or more of the parties and/or international cooperating partners through ODA directly with the Commission. As part of a study to evaluate the potential sources of finance for trans-boundary conservation initiatives under ORASECOM, it was indicated that any possible user charges and levies would have to be raised in each country under the relevant legal provisions, but that this would be limited by ORASECOM's advisory mandate.

In Uganda a variety of other sources of ODA are being specifically applied to support trans-boundary WRM activities. These include active participation and financial/capacity-building support from two trans-boundary organisations:

- The Nile Basin Initiative (NBI), where the DWRM, Director and Commissioner for Planning/Regulation are members of the Nile Technical Advisory Committee, and the Minister of the Ministry of Water and Environment is a member of the Nile Council of Ministers
- The Lake Victoria Basin Commission (LVBC), where DWRM senior management participate in various technical committees and the Minister of the Ministry of Water and Environment represents Uganda on the Council of Minister. In the cases of both the NBI and LVBC, financing is derived largely from international development assistance.

Further trans-boundary intervention is through the Lake Victoria Environmental Management Project, Phase II (LVEMP II). This is an eight year programme, which commenced in late 2009, with a total value of about USD 250 million. It is co-financed by the five basin countries (Uganda is committed to contribute about USD 2.1 million) with support from the Global Environmental Facility (GEF) and the World Bank. The LVEMP II is being implemented under the auspices of the LVBC, which in turn has been established under the East African Community.

7. Lessons and challenges from the African case studies

7.1. Ghana

The daunting challenges faced by WRM in Ghana include pollution, catchment degradation, insufficient public awareness of the need to protect water bodies, enforcement of regulations, and institutional coordination. Programmes designed to protect riverbanks and river basins from degradation are also needed. The lack of funds and capacity weaknesses in district assemblies responsible for WRM activities underlie these challenges. The case study illustrates the difficulty of focusing on financing for WRM, as policy is mainly focused on water supply and sanitation.

Strategies and guiding principles drawn and implemented by government to achieve sustainable WRM have been undertaken over the years. The main public institution responsible for managing water resources in Ghana is the Water Resources Commission which, along with other institutions, has devised programmes and policies to ensure sustainable development, management and use of Ghana's water resources to improve health and livelihoods, reduce vulnerability while assuring good governance for present and future generations. The Government's policy framework has also identified measures linked to the sustainable use of wetlands and water resources and Integrated Water Resources Management.

Good ideas and strategies have to be transformed into action. The Government's funding commitment to ensure implementation of these measures has been inadequate. Annual budgetary allocations to the Water Resources Commission have often fallen far short of required levels, meeting less than 15% of total annual financial requirements on a consistent annual basis. The irrigation sector in Ghana requires more access to credit and investment funds for infrastructure.

The three main sources of funding for water in Ghana are the Government's annual budgetary allocations and other development votes, external support agencies, and

internally generated funds (IGFs) - mainly through raw water abstraction fees. Support from external agencies (in the form of grants) has been the largest source. In a bid to address the perennial inadequate funding cycle for WRM in Ghana, various sources of revenue and funding have been tried, including own finance from private agents who are entitled to exploit a source of water; loan funds from financial institutions, with or without government guarantee; grants from donors and development partners; and public subsidies on capital and current accounts.

With the exception of ODA, these financing sources have not yielded sufficient resources. Subsidies from public current accounts have been only a small fraction of annual public budgets. Water use charges have yielded only 60% of targets. On the other hand ODA has contributed materially to the improvement in water supply coverage as well as in sanitation facilities. ODA for water has often exceeded funds sourced and utilized locally and this is not sustainable. Financing for WRM needs to be given increased attention, following the successful support provided for water supply and sanitation, in order to secure reliable water for economic growth.

7.2. South Africa

The development of both social and economic infrastructure was adequately funded, partly due to sustained economic growth and increasing government revenues. However, in hindsight, it can be concluded that the strategies, methods and approaches to implementing the NWA in South Africa were generally over-ambitious, had significant resource requirements and did not typically consider the financial implications of implementation in a developing country with resource limitations. A key lesson is to understand and account for operational costs, which can quickly spiral out of control. A sizeable portion of the revenues from water was needed to support the historical under-recovery of operational costs on the water services infrastructure inherited from the former homelands. This then contributed to the under spending on maintenance, which in turn led to belated refurbishment budgets. A recent asset review has indicated the need for up to R1 billion per year to refurbish and replace infrastructure over the next 10 years.

It is hard to judge whether the budget allocation has been adequate over the past 10 years since there are no good benchmarks on the appropriate size of WRM expenditure in developing countries. In any case, these would need to reflect the conditions and challenges faced in each country. In South Africa there are three possible signs that increased investment is needed in WRM:

- a continued deterioration of water quality in many parts of the country due to increasing urbanisation and the inadequate treatment of waste discharge;
- a decrease in the reliability of water supply in many basins, due to unlicensed expansion of irrigation, abstraction of water and development of small farm dams;
- a deterioration in the state of national and regional infrastructure throughout the country due to inadequate investment in maintenance and refurbishment.

This situation reflects a shortage of finance, as well as losses of human resource capacity, which has been recognized by the government which has responded with recent prioritisation and budget allocation to infrastructure refurbishment and water use management.

Implementation of key aspects of the 1998 NWA has been slower than planned, particularly in the following respects:

- resource protection (classifying water resources and determining environmental flows),
- water allocation (redress of historical inequities and achieving environmental flows),
- institutional development (CMA establishment and WUA transformation), and

- information management (creating systems).

Reflecting more generally on the South African experience, the development of water resources infrastructure funded through the Treasury until the early 1990's has underpinned the growth of the primary agricultural, mining and secondary manufacturing urban economies. More recently, economic water resources infrastructure funded off-budget supported the growth of the tertiary urban economy. This allows fiscal support to be shifted to water supply for social infrastructure and rural development.

The increasing development and exploitation of river basins in the course of economic growth and demographic shifts added to water stress and management complexity. This has required greater investment in water resources governance and the introduction of financial instruments to recover costs and influence the behaviour of water users and dischargers. South Africa continues to address inequalities in society, where the poorest rural dwellers have few livelihood opportunities. A pro-poor water resources management philosophy requires investment by the state in local meso and micro level infrastructure to support rural development (as opposed to widespread urbanisation), which in reality will be largely focused on agriculture. The ability of the formal economy to pay the full financial costs of water resources infrastructure leverages and/or releases state resources which can then be used for investment for those communities that cannot currently afford to pay for the capital and operating costs.

Capital financing of economically driven water resources infrastructure from commercial sources, through a special purpose government vehicle, provides an important mechanism to reprioritise state resources for social purposes, but does have challenges. The need for long-term project-based off-take agreements to be signed by economic users before implementation, as a requirement for funding poses challenges in basins with multiple or changing users, unidentified future users or resistant institutions, even where a compelling case can be made for economic development. The risk management requirements of implied guarantees on income streams may be resisted by National Treasury, while the need to manage the project by the "financing entity" can cause institutional problems with the government infrastructure managers. A potential solution may be found in the establishment of an infrastructure entity with an asset base and income stream, but this itself poses political, governance and institutional challenges.

Implementing cost-recovery on governance functions provides an important mechanism for financing the increasing water resources management requirements in highly developed-utilised basins. However, users tend to resist additional charges, except where the value-benefit of these charges is apparent, the collection-disbursement is transparent and/or the information-billing systems are effective. Consequently, these charges may be particularly effective when linked to meaningful institutional decentralisation that balances national imperative and local interest. Care must therefore be taken to ensure adequate service delivery of associated water resources management functions, communication/marketing and system development, by understanding and allocating the resources required to overcome resistance and inertia by those charged. It should also recognise that excessive enforcement of revenue collection may alienate those users whose participation in water resources management is often as critical as the charges that they pay.

While many potential financial mechanisms and instruments could be used to collect revenue and/or create incentives for behaviour change, these need to be designed as a coherent package that achieve national/basin water resources management goals. While the primary objective of both governance and infrastructure charges is cost-recovery, the former typically have limited impact on the behaviour of all but the most inefficient agricultural users. On the other hand, full-financial cost recovery for infrastructure may begin to affect water use efficiency by urban domestic and industrial users, while being completely

unaffordable to irrigation. The macro and micro implications (and potentially perverse outcomes) of the suite of financial instruments should be understood before adopting them, together with the most effective institutional arrangements for their implementation (preferably building on existing institutions, rather than developing them anew). Overall South Africa has made considerable progress on financing WRM and the case study illustrates how this requires a continuing long term learning process.

7.3. Uganda

The management and development of water resources in Uganda is anchored in the policy and legal framework established in the 1990s based on the principles of Integrated Water Resources Management. A National Water Action Plan was developed in 1995, which guided substantial investments in water supply for more than a decade. It has made good progress in attaining the Millennium Development Goals (MDGs) for water supply. Investments in other water resources sub-sectors (e.g. irrigation and hydropower development, and environmental management) have however lagged behind.

Institutional reforms have improved the *enabling environment* through clearer designation of the responsibilities of governmental and non-governmental stakeholders. But reforms are still needed. Revenues from the delivery of services and regulations revert directly back to the general budget rather than to the service or permit provider. Efforts to generate revenues through permit application fees, water quality laboratory analyses and annual fees for abstraction and discharge permit holders have so far not resulted in substantial income.

In spite of the clear and early commitments of the Government of Uganda to the importance of WRM, its role in the social and economic development of the country remains poorly understood. In recent years, financial support for WRM has diminished in comparison with other sectors and it continues to be allocated proportionally lower rates of governmental budgetary funding each year.

The low priority of the water and environment sector may be partly explained by the fact that Uganda's water resources have been plentiful in relation to demands, certainly in comparison with other countries in Eastern and Southern Africa. There have been limited water-related stresses to date. However, relative abundance and limited stress may be coming to an end: very high population pressures (amongst the highest growth rates worldwide); very high population densities ; the likelihood of increased stress due to climate change; urban development and environmental degradation are all increasing stresses on water resources quality and quantity.

The Government has not yet effectively communicated the value and importance of sound water and environmental management to the people of the country, including its own decision-makers. It is incumbent on the managers and developers of water resources to demonstrate more widely the value-added of WRM and the importance of sound investments in managing and developing the resource, for the overall economic development and well-being of the country. This challenge remains.

8. Overall conclusions and ways forward

This concluding section has four parts:

- general reflections on WRM
- WRM in international fora
- WRM on the African agenda
- Practical measures at national level arising from the case studies.

8.1. General reflections on WRM

Good water resources management benefits the wider economy in many ways and it ought to be a priority for the Ministry of Finance. More needs to be done to alert finance officials to the fundamental importance of WRM.

WRM seems to be a widespread "problem" in the sense that the set of policy issues that it comprises are rarely, if at all, dealt with coherently and satisfactorily. Responsibility for the various strands of WRM fall to different branches of government, and not surprisingly their funding is fragmented and incoherent. It is only recently that the integrated approach to water resources management has been recognised. Most countries are at an early stage in developing plans and assessing WRM status, needs and funding requirements. Fragmentation remains an issue and in many administrations, what can't be measured tends to be neglected.

In some countries, particularly those with the greatest challenges to reach the targets set by the Millennium Development Goals, water policies and budgets are understandably dominated by the needs of household water supply and sanitation. There is, however, evidence that a neglect of WRM can place MDG achievements in jeopardy, e.g. where the supply and quality of water is not properly safeguarded, nor its use regulated. It is significant that in South Africa, the WRM budget per head, both in total and for recurrent items, has increased over the last decade, even though the relative importance of WRM has fallen within the total national budget.

8.2. WRM in international forums

The main international champions for financing WRM have been the Global Water Partnership, the OECD and EUWI-FWG. Whilst many countries have adopted integrated approaches and drafted plans (A recent UN-Water survey indicates some 80% of countries have made progress on IWRM planning), progress on the implementation of plans has been slow.

The lack of progress on financing for WRM was noted by the Camdessus report (2003), which recommended further study of this topic. The GWP set out a framework for financing and water governance in 2008, which the OECD has built on with a series of case studies, drawn mainly from its Member States. This led to the development of a report *Financing Water Resources Management* (forthcoming 2012) that was supported by the EUWI Finance Working Group and UNEP Since 2007, the FWG and GWP have jointly organised a series of workshops in the five African sub-regions to raise awareness of financing issues and share lessons and this is reported in a report *Unlocking finance for water security.*

The momentum of this topic needs to be sustained. One practical way would be to examine how aid for WRM is currently recorded in Member Countries' reporting to the OECD's Development Assistance Committee (DAC), and whether it would be feasible to improve the definition of WRM and encourage greater consistency and transparency in the way ODA for

WRM is recorded. This also touches on the way financial guarantees are reported for DAC purposes.

More information and coordination is needed on donor experiences of financing WRM and TWM. The EUWI and OECD-DAC should investigate databases to extract more useful statistics on aid for WRM. External Support Agencies should channel more support to improve pre-investment conditions, e.g. by actively supporting African countries to access funds from the AWF and the EIB-AU infrastructure TF for transboundary water programmes.

International support needs to be examined more thoroughly to determine the added value (qualitative and quantitative) from the Donor and IFI support for international programmes (such as GEF). More coordinated EU donor support for negotiations on transboundary waters at regional level is needed, particularly to support smaller or weaker riparian countries. The EUWI should build on the case studies and share experiences across Africa to build capacities and develop tools to support countries in financing for WRM.

8.3. WRM in the African agenda

There is no lack of African institutions that could be vehicles for the promotion of WRM at continental, regional and national scale. At ministerial level, NEPAD and AMCOW are well placed to promote this agenda, gathering data on government and donor support for WRM, monitoring progress and sharing lessons. They need to give WRM equivalent focus to that for domestic water supply and sanitation services, especially given the need for climate adaptation. The Regional Economic Commissions would also be appropriate fora for considering the topic in its transboundary dimension – which is relevant to the majority of countries, while the various River Basin Organisations could take discussions down to a finer level of specificity.

When it comes to developing infrastructure as part of WRM, the African Development Bank hosts two important programmes – the Infrastructure Consortium for Africa, and the African Infrastructure Knowledge Programme (successor to the African Infrastructure Country Diagnostic, which included water resources in its influential report *Africa's infrastructure: a time for transformation*). Larger infrastructure schemes with a regional dimension are eligible for support from the EU-Africa Infrastructure Trust Fund, which blends grant, loan and equity from different partners. Capacity building for WRM can be supported by the EU Water Facility and the Africa Water Facility, while the ACP Water Project Preparation Facility (funded jointly by EIB and EUWF) exists to identify and prepare projects to tap EU grants.

The case studies showed that South Africa is relatively advanced in financing WRM and has many lessons and experiences that can be adapted by other Sub-Saharan African countries.

8.4. National measures for financing WRM

Some of the main lessons from material used in this paper can be summarised under eight headings: information; structuring; public finance; Institutions; ODA; cost recovery; infrastructure solutions; and transboundary cooperation.

Information: making the case for WRM financing

It is clear from the case studies and the wider documentation on WRM that much remains to be done in clarifying the meaning and scope of this topic and what it entails for policy-makers. Different authorities mean different things when talking about WRM. Building on the growing spread of IWRM plans, WRM needs to carve out a larger domain for itself in the water and infrastructure agenda, to include the various functions to be performed, how these

are dealt with across different national institutions, and the type and amount of funding going to support them. Proponents of WRM must demonstrate and explain the links between the different WRM functions and how they contribute to the broader national development aims.

The case studies demonstrate the need for coherent data on financing for WRM. There is also a need to improve monitoring and evaluation of the WRM functions. The costs, financial needs and funding sources can be better understood through a more rigorous analysis of what is actually spent, and for which purposes, as the basis for determining value for money, and ensuring adequate budgets for vital functions.

The economic benefits of WRM need to be compiled and the added value of investing in WRM demonstrated to decision-makers. This also needs to be put in the context of climate resilience – since the various kinds of WRM are obvious adaptation measures and include many *no-* and *low- regret* projects.

Structuring the finances of WRM

Once the scope of the topic and its institutional space is clearer, its financing can be approached in a more transparent and systematic fashion.

This paper contains several basic principles that can guide the choice of funding modalities, though in the last resort pragmatism may well be the deciding factor. The concept of Strategic Financial Planning which has been promoted for household water and sanitation may have relevance for elements of WRM too. Keynotes of SFP are data collection, formulation of plans and scenarios, estimation of financial implications of scenarios, iteration to reconcile financial requirements with potential funding, and processes of stakeholder dialogue and consensus building[15].

Public finance for public goods: the role of government budgets

The governance and stewardship functions of WRM are predominantly *public goods.* This implies that governments have to take the leading role in their implementation and financing. However, this does not exclude the possibility of *some* recovery of costs from users, or co-financing from interested parties in business and civil society. Governments can use their powers to tax and charge penalties in order to discourage *negative externalities* such as pollution or excessive abstraction. In many countries revenues from such charges are recycled into environmental spending, which can include WRM. Environmental regulation can also be used to transfer the cost – and financing - of some parts of WRM onto water users themselves.

In Africa payment for the cost of managing water resources is likely to be covered almost exclusively from general taxation through budgetary allocations for the immediate future. The present levels are very low and irregular, and the case studies indicate that a first priority for financing WRM is for governments to perform better and make budget allocations more predictable and timely, less arbitrary and more consistent year by year. Thus sustainable financing for WRM may require a diversification of funding sources, to include cost sharing and charges raised on direct beneficiaries.

[15] EUWI-FWG, *Strategic Financial Planning for water supply and sanitation in Africa.* May 2010

Institutions

The water governance functions of WRM are key to ensure that financial resources are applied in a way that generates the highest benefit for society. For WRM to be properly done, the Ministry of Finance needs to allocate *and disburse* resources from general taxation (and budget support) and ensure that any financial resources for WRM are used effectively and efficiently. The responsible water resources agencies should be able to use 'revenue-generating' instruments and keep the revenues they raise as well as to attract grant funding from donors.
For this to be institutionalized and transparent to stakeholders, an explicit water financing policy is needed that establishes water financing principles and water financing instruments, which could be developed through a thorough analysis and consultative process.

Using Official Development Assistance

ODA can be very useful in the early stages of building the enabling environment (policies, laws, regulation) and in institutional strengthening (governance systems, capacity, stakeholder participation) and in access to information. Several case studies show that countries have relied heavily on ODA for this type of capacity building for WRM. In order to avoid long-term dependency on ODA, host countries should budget for progressively rising amounts of domestic support to supplant external funding.
Donors can also play a catalytic role in leveraging other finance, e.g. by blending grants with IFI and commercial loans, paying for the 'soft' components that oil the financial wheels, and providing guarantees from aid budgets to facilitate commercial loans and private investment (this topic is further discussed in the section below on infrastructure).

Raising revenues for WRM

In many countries much of the cost of WRM governance and stewardship is met from direct budgetary transfers, but these can be supplemented by specific taxes and levies targeting beneficiaries of WRM, or conversely, penalising those who add to its costs. In Ghana these include fees for applications, raw water abstractions, and drilling licenses; in South Africa a water resource management charge is levied on consumptive water users and wastewater dischargers in a river basin. In some European countries WRM costs are recovered by adding a component to the water tariff for domestic or industrial purposes. Revenue generating instruments are in use in various countries but their effectiveness is not well understood. Also, it is important to balance revenue generation with administrative capacity to manage the process.

Solutions for financing infrastructure

Financing WRM infrastructure opens up a wide range of financing sources and instruments. The key services it provides (water for households, farmers and industries, and hydropower) generate their own revenues, and some of the other functions it provides (flood control, recreation, navigation, environmental flows, pollution control etc) lend themselves to other means of raising revenues.

The mixture of strategic, public and commercial benefits from infrastructure makes for a variety of financing models, often involving hybrid forms combining different types, backed by state or external guarantees (e.g. see Box 6.1), and often creating Special Project Vehicles. The South African case study illustrates the potential for combining public and commercial finance much of it raised through the TCTA, a state-owned entity with considerable autonomy for raising funds and implementing schemes on its own account.

Transboundary WRM

For WRM at the transboundary level, a crucial issue for most African countries, governance would normally be funded by governments and international agencies, while infrastructure costs would be recovered from users and beneficiaries in the partner countries, in proportion to the size of their respective benefits. Donors have a particular role to play in supporting the creation of transboundary organisations. Certain institutions have a particular focus on transboundary and other regional management bodies – e.g. the AWF, EU Water Facility, and the EU-Africa Infrastructure Trust Fund.

In the common situation where transboundary WRM involves infrastructure the project financing packages may need to involve a number of different parties, contributing according to their different interests and resources. One such programme, the Lake Victoria Region Water and Sanitation Initiative aims to manage the Lake catchment and control its growing pollution, as well as supply water and sanitation services to a rapidly growing population. The programme brings together resources and funding from the East African Community, UN Habitat, AFDB, AWF, KFW and EIB, through the EU-Africa Infrastructure Trust Fund.

8.5. The need for further work

Placing WRM onto a sustainable financial basis that will give Africa the water security it vitally needs is a complex matter, for which there is no “silver bullet” or “perfect instrument”. Policies and instruments should be adapted in the light of experience. Although the experience of peer-countries is highly instructive, each country needs to adopt its own appropriate and cost-effective solutions, taking into account what is feasible with its available resources and constraints.

This study has only touched the tip of the WRM iceberg and is thus presented as an “interim report” with the aim that UNEP-DHI will continue to develop the argument further. The case studies are the first attempt to get real information on financing WRM in African countries and more work is needed to secure more analytical data. Many obstacles were encountered in their preparation and clearly more research is needed to get a better picture of financing WRM in African countries. South Africa, amongst the countries in the case studies used here, has gone furthest towards using a coherent set of financial measures for WRM. It illustrates how progress is uneven, with reverses as well as advances.

There is a need to go beyond theoretical analysis and dig deeper into national realities. More in-depth research studies are needed that make a clearer distinction between costs and revenues and assess the potential for cost savings as well as investment.

Whilst this report has used a typology of financing for governance-stewardship-infrastructure functions, it is not ideal and there are overlaps. Similarly, the distinction between public and private goods is not straightforward and more theoretical work is needed that is beyond the scope of this paper. A more structured analytical framework needs to be agreed by various players seeking to put this subject on a sound basis recognising that what is not measured is not managed (nor funded). The aim should be to catch up with the sophistication of current knowledge on financing water supply.

In the future achieving water security will become a more critical policy imperative for Africa. Economic and social development, climate adaptation and the demands for a green economy will require a much more sophisticated and effective approach to financing the various water resources functions. More work is needed to quantify the economic value of water security for the broader national economy in order to raise awareness among political and financial decision-makers.

Annex: Bibliography and key references

Acteon, *Notes on financing water resources management*. Background report for the OECD Expert Meeting on Water Economics and Financing, March 2010.

Ankomah Asante F. and Asuming Boakye A., *Financing water resources management: An analysis of how financing of water resources management take place, current experiences and emerging challenges in Ghana.* November 2011. [Ghana case study for EUWI-FWG and UNEP-DHI]

Camdessus Report (2003). *Financing water for all: report of the Global Panel on Financing Water Infrastructure.* Editor J.T.Winpenny. GWP/WWC.

Directorate of Water Resources Management, *Financing water resources management: An analysis of how financing of water resources management takes place, current experiences and emerging challenges in Uganda,* 2010. [Uganda case study for UNEP-DHI]

EUWI-FWG, *Strategic financial planning for water supply and sanitation in Africa*, May 2010.

EUWI-FWG and GWP, *Unlocking finance for water security: Building capacities and raising awareness*, April 2012

Foster V. and Briceño-Garmendia C. (Ed), *Africa's Infrastructure: A Time for Transformation*, The Africa Infrastructure Country Diagnostic (AICD), 2010.

Grey, D. and Sadoff C., *'Sink or Swim? Water security for growth and development'*. *Water Policy* 9(2007): 545-557.

GWP-Southern Africa, *Regional Paper on Financing Water Resources Management. Overview from five countries.* Presented at the SADC Water Dialogue, Swaziland, June 2011.

Joyce J. and Granit J.**,** *Challenges and opportunities for financing Transboundary Water Management and Development in Africa.* June 2010*.* [Paper produced by SIWI for the EUWI-FWG]

Pegram G. and Schreiner B., *Financing water resource management: the South African experience.* Pegasys, Feb 2009 (South Africa case study for EUWI-FWG)

Rees J. Winpenny J. and Hall A., *Water financing and governance.* GWP, TEC Background Paper No 12, April 2008.

Martin-Hurtado R., *Pricing water resources to finance their sustainable management: a think-piece for the EUWI Finance Working Group*, EUWI-FWG, May 2012

OECD, *Financing Water Resources Management -- An OECD Perspective.* OECD Publishing, (2012 forthcoming).

OECD, Expert Meeting on Water Economics and Financing, Paris in March 2010. http://www.oecd.org/document/7/0,3343,en_2649_34285_45005511_1_1_1_1,00.html

OECD, *Managing Water for All: An OECD perspective on pricing and financing*, 2009

SADC, The 5th SADC Multi-Stakeholder Water Dialogue, *Watering development in SADC: Financing water for climate resilience to ensure regional security*, Swaziland, June 2011

EUWI FWG Publications:

- *Pricing water resources to finance their sustainable management: a think-piece for the EUWI Finance Working Group* (EUWI-FWG, May 2012)
- *Small-scale finance for water and sanitation* (EUWI-FWG/SHARE, 2012)
- *Unlocking finance for water security: Building capacities and raising awareness* (EUWI-FWG/GWP, 2012)
- *Financing for Water and Sanitation: A primer for practitioners and students in developing countries* (EUWI-FWG, 2011)
- *Strategic financial planning for water supply and sanitation in Africa* (EUWI-FWG, 2010)
- *Planification financière stratégique pour l'alimentation en eau et l'assainissement en Afrique* (EUWI-FWG, 2010)
- *Economics in sustainable water management: Training manual and facilitators' guide* (EUWI-FWG/GWP/Cap-Net 2008)

EUWI-FWG and Global Water Partnership
Drottninggatan 33
SE-111 51 Stockholm
SWEDEN
www.euwi.net/wg/finance I www.gwp.org