



Project to Revise the Pricing Strategy for Water Use Charges and Develop a Funding Model for Water Infrastructure Development and Use and a Model for the Establishment of an Economic Regulator

Review of Principles and Experience for Infrastructure Finance

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1 Introduction

The purpose of this document is to interrogate the conceptual model developed during the Inception Phase, in order to understand the principles that underpin it or that stem from it, and how these principles determine the financing mechanisms or models available to fund water infrastructure. A review of local and international case studies helps to identify what principles have been applied elsewhere and how lessons learned in other countries or sectors can inform the development of principles for the South African water sector.

2 Context for water infrastructure finance

2.1 Underlying purpose of water management

The conceptual model developed in the Inception phase shows that there are fundamentally only three products of water management, and that these link the range of water institutions with the range of clients, namely:

- *raw water*, available for agricultural, industrial, mining, power generation, and household water users;
- *potable water* for domestic, commercial, institutional and industrial consumers provided at point of use, as well as removal of waste water from the point of use; and
- *ecosystems good and services*, related to the sustainable functioning of the aquatic environment (including biodiversity), providing attenuation, assimilation and instream water use.

All water infrastructure serves to deliver the above products, within the context of the broader conceptual model depicted in Figure 2-1 below.

It depicts four layers that are required for water management:

- The reconciliation of *water availability, requirements and use* to achieve broader political, social, economic and environmental imperatives drives and therefore underlies the entire structure (referring back to the three key products of water management).
- The development, operation and management of *water infrastructure* (in its broadest sense) to enable this use and management of water along the entire value chain.
- The *water Institutions* that are responsible for the management, development and operation of this water value chain (as opposed to the oversight and regulation thereof), including project implementing agents (IA), special purpose vehicles (SPV) and public-private partnerships (PPP).
- The sources of capital and operating finance to resource these institutions to perform their management, development and operating costs, distinguishing recovery of tariffs and charges from access to government grants and subsidies, supported by commercial investments.

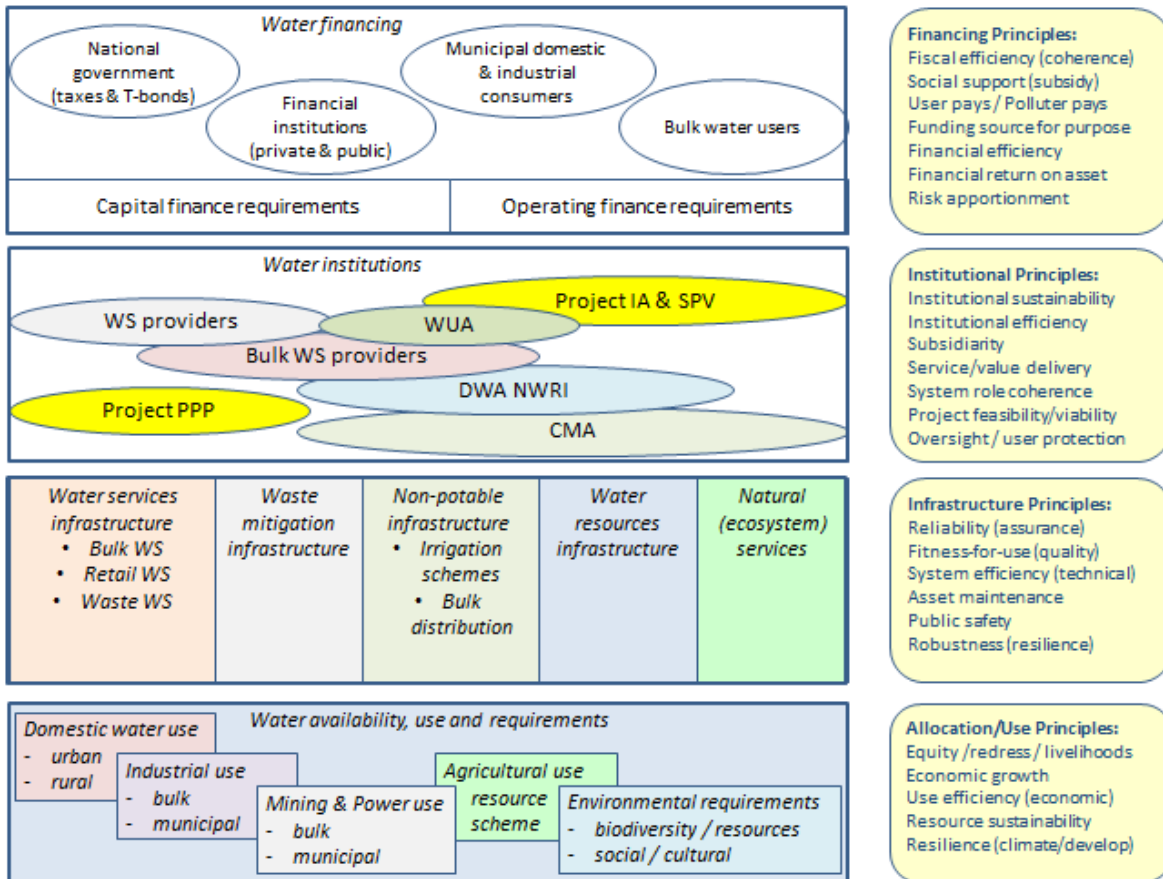


Figure 2-1 Conceptual model for Water Management

2.2 What do we mean by infrastructure

The types of infrastructure which require financing cover the entire value chain, including ‘natural infrastructure’ such as aquatic ecosystem attenuation services. Infrastructure is required for the catchment, water resources, bulk water services and water services. It falls under the management of a range of institutions – as shown in Figure 2-2 below.

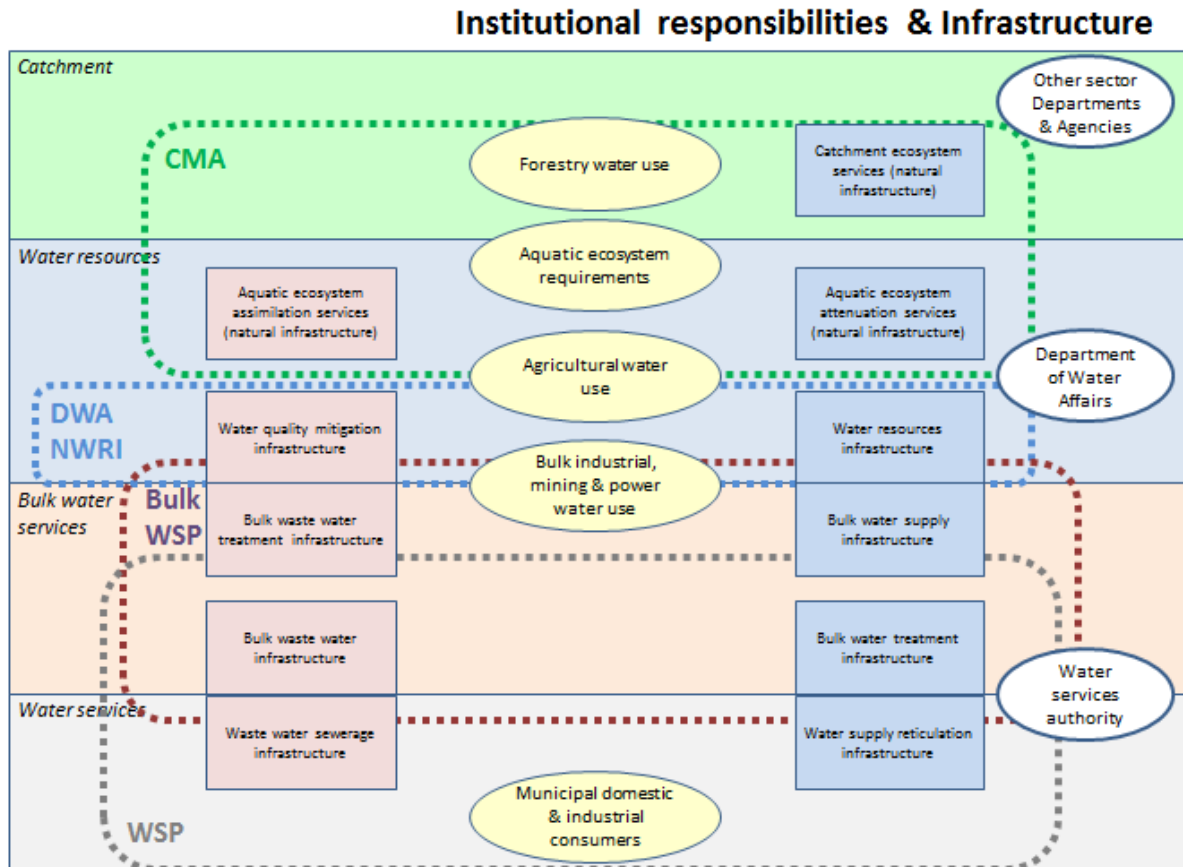


Figure 2-2 Water Infrastructure and responsible institutions

2.3 The financing of infrastructure

2.3.1 Financing versus Funding

The terms 'financing' and 'funding' are sometimes confused. It is therefore necessary to clarify how they are interpreted in this study.

'*Financing*' is about managing cash-flow related to infrastructure development. It is concerned with raising the capital required to enable the initial investment in infrastructure.

'*Funding*' is about who ultimately pays for the infrastructure. It relates to paying for that capital (often over time) as well as the subsequent operating costs required to sustain the infrastructure.

Debt and equity can only be a source of finance, not a source of funds, as they need to be paid back. Grants from the fiscus and transfers from international donors are both a source of funds as well as a source of finance. Income from user charges is a source of funds, but usually not a source of finance, since the charges are usually only collected after the infrastructure has been built and is operational. User charges are therefore usually used to pay off sources of finance such as debt and dividend payments for equity investors. An exception is surpluses generated from user charges which are used to build up reserves. These reserves can then be used to finance future infrastructure development. The Return on Asset portion of the raw water charge is an example of

this, as well as the surpluses accumulated by some of the Water Boards over the past few years, which have been built up with the express intention of financing future development.

2.3.2 Sources of funds

Public sector infrastructure finance is almost always concerned with three types of investment:

- new build to cater for increased demand and extension of services,
- refurbishment and backlogs to cater for existing users and overdue investment; and
- operations and maintenance (O&M).

Each of these may attract different funding sources and require different financing mechanisms.

Regardless of the type or category of infrastructure, there are only three ways to pay for it – taxes, transfers (grants, donations) and tariffs. The ‘three T’s’ were put forward by the World Panel on Financing Water Infrastructure (the “Camdessus Panel”, established in 2001), and reiterated by National Treasury at the recent Infrastructure Indaba, where it was clearly stated that there are only two ways really open to South Africa: Taxes and Tariffs.

So the two main sources of funds for water infrastructure or management are:

- Taxation through the fiscus (National Revenue Fund), or targeted levies, such as municipal rates.
- Tariffs or charges, to recover the costs of infrastructure or services provided in supplying water or treating waste water.

The third source, namely Transfers, should be considered for funding the additional costs of robust infrastructure that provides resilience and adaptation to climate change, through mechanisms such as the global Green Fund.

2.3.3 Sources of finance

Whilst grants from general taxation and transfers are sources of funds, they can also be a source of finance, where the money is provided up front. All other sources of financing, such as debt (or equity) provide mechanisms to (i) manage cash flow by deferring repayment, (ii) manage balance sheets by shifting liabilities, or (iii) share risk (and return). All of these must be paid back at some stage through tax revenue or charges, typically at a premium reflecting the risk and cost of capital. Utility Reserves are also a form of finance. They do not need to be paid back, but they represent funds collected in advance through the generation of surpluses (from user charges).

Whilst the sources of funds may be limited, there are a variety of financing mechanisms that can be employed to match the cash flow of these funds to the cash flow required to finance the establishment (and subsequent operations and maintenance) of the infrastructure. These mechanisms include the use of debt and equity from a range of institutions (private, public, multi-lateral, etc.). Private sector involvement can range from equity investment to long-term concessions.

An illustration of the different sources of financing, and how they can be extended to cover the financing gap, is provided below, courtesy of the OECD report on Innovative Financing Mechanisms in the Water Sector (2010).

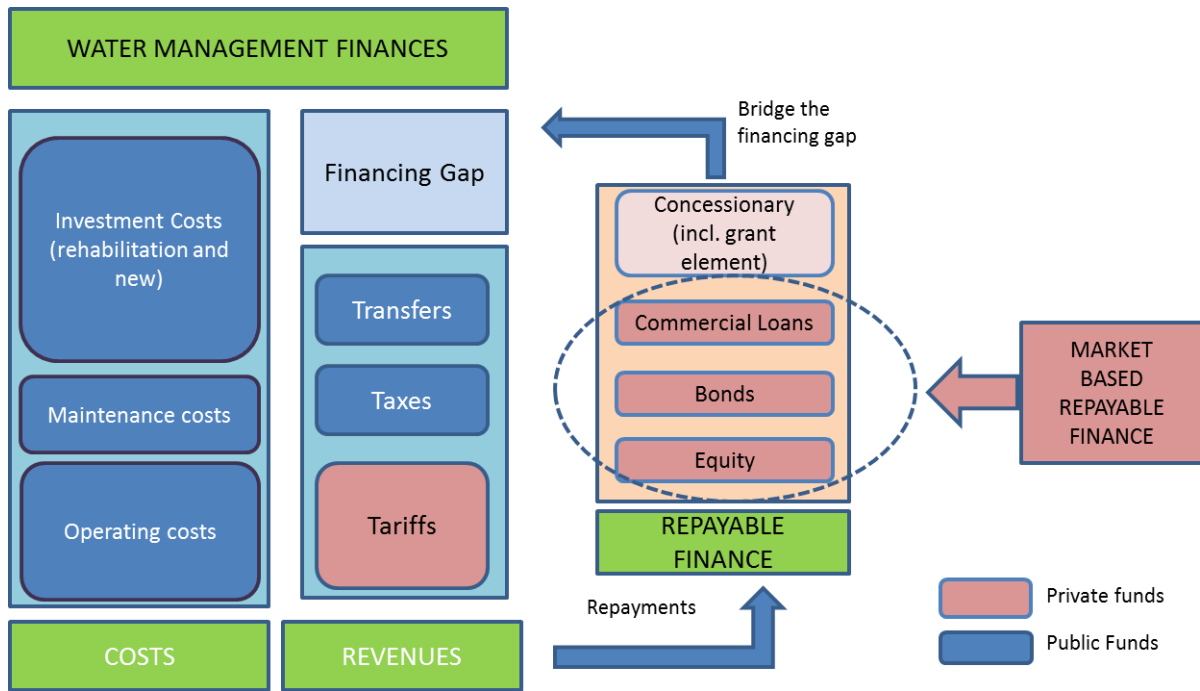


Figure 2-3 Innovative Financing Mechanisms for the Water Sector – OECD 2010

The role of institutions in the financing cycle shown above is illustrated in Figure 2-4 below, which outlines a generic framework for financing of infrastructure (or any other management intervention) by these institutions.

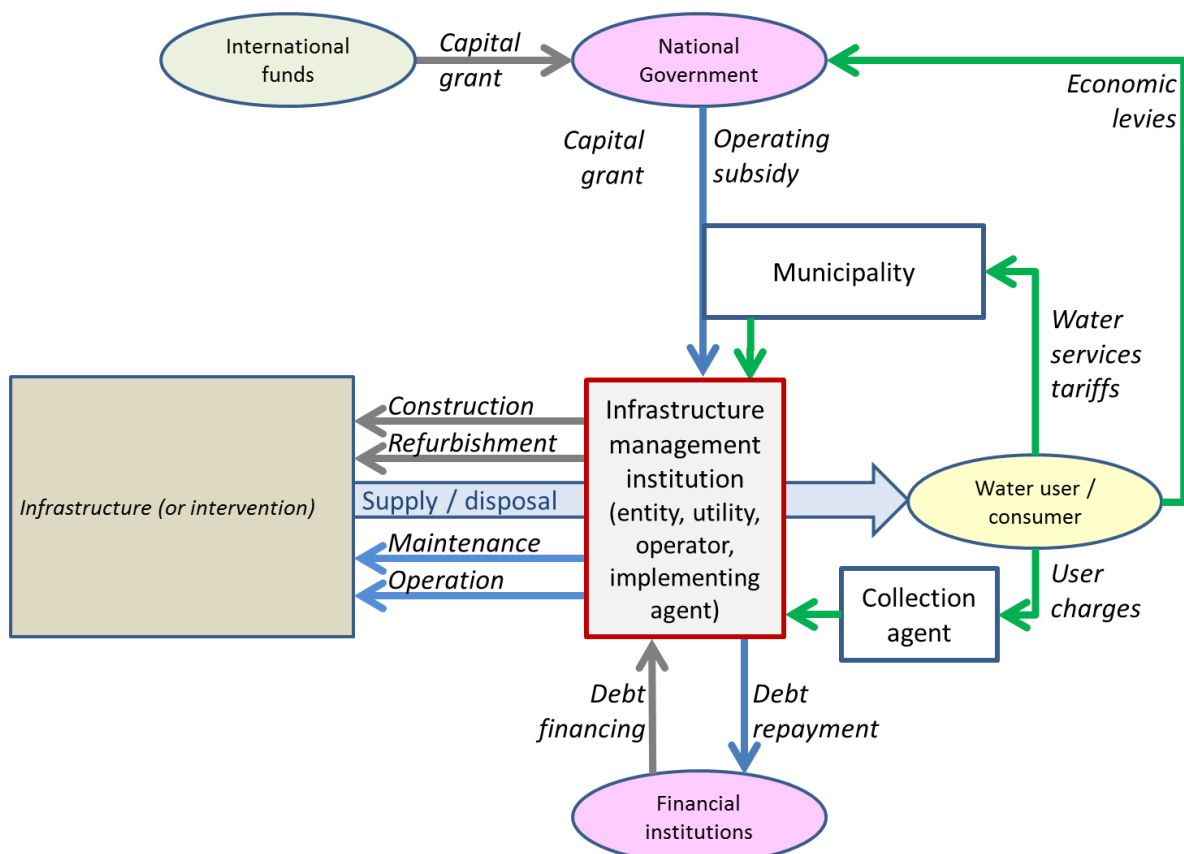


Figure 2-4 Financial flows for infrastructure development and operation

In Figure 4, the grey lines reflect capital financial flows required to develop, improve, refurbish or rehabilitate the infrastructure. This capital may come from national (or provincial government grants), debt (or equity) from (private or public) financial institutions, or financial reserves (or own sources) from the water institution itself. Where the water institution is also the municipality as water services provider, this may be from accumulated capital reserves (not linked to water services).

The blue lines represent ongoing financial flows required to operate and maintain the infrastructure (intervention), repay any debt (or returns) or possibly build a reserve in the water institution (for future interventions). The green lines represent the payment by water users or water services consumers in return for water supplied or waste water discharged.

It is worth noting that any economic levies that do not constitute cost recovery (such as the waste discharge incentive charge or a possible efficiency levy) are typically returned to the national revenue fund, even if they are implicitly earmarked and returned through the budget process (grant or subsidy) for local intervention.

2.4 The Macro Context

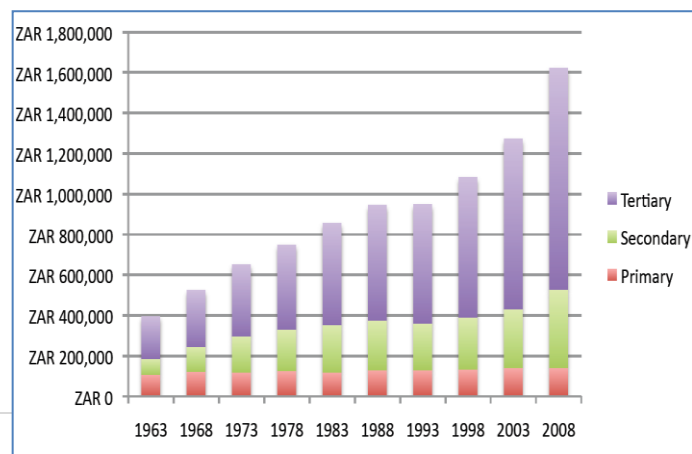
There are a number of important trends in the South African water sector, society and economy that need to be considered in the development of financial and institutional models.

2.4.1 Financial crisis and constraints

The global financial crisis impacted negatively on the South Africa economy and reduced the growth in tax revenue available to fund the multiplicity of demands on the fiscus. As a result, government faced a tightening of departmental budgets while the private sector faced reduced profits and job losses. While business confidence is improving, and the economic outlook is strengthening, there continue to be constraints on the financial resources available from government, as well as the availability of commercial sources of finance. Despite this, government has remained committed to a large public infrastructure spend with social and economic benefits, which has relevance for the water sector amongst others.

2.4.2 Shifting nature of the South African economy

The structure of the South African economy has changed significantly in the last 60-70 years. In particular, the economic focus has shifted from the production of goods to the provision of services, even though mining and agriculture are still economically important. The share of the primary sector of the economy dropped from 26% in the 1950s to just over 11% in the 1990s, with most of this decline taking place in the '90s. The most remarkable change, however, has



been the growth of the tertiary sector, particularly since the 1990s, as illustrated in the figure to the right.

These shifts in the economy mean that while the relative contribution of primary (resource based) sectors to the economy has reduced, agriculture still remains the largest user of water in the country. At the same time, increasing industrialization and the legacy of mining has seen major water quality impacts that have impacted on treatment costs, environmental sustainability and usability of water for downstream users. Increasing urbanization and poor wastewater treatment by municipalities serving the tertiary economy have contributed to increased municipal water use and pollution of water resources.

2.4.3 Inequalities in the South African society

Despite the economic recovery since 1994, and despite its status as a lower middle income country, South Africa remains a country in which inequality is unacceptably high, as reflected in one of the highest Gini coefficients in the world. This inequality raises challenges in relation to rural development, and economic redress and redistribution, and in the context of water scarcity, issues of appropriate allocation and pricing of a scarce natural resource. While huge strides have been made in providing water for basic domestic purposes to poor South Africans, the ongoing call for access to water for productive purposes, particularly in rural and peri-urban areas has not been adequately addressed.

2.4.4 Food, energy, trade and water nexus

As a water-scarce country, South Africa is faced with a number of tradeoffs in the allocation of water between different sectors. Water is a critical input to the production of food and the production of electricity, and the potential trade-off between these two as a result of water scarcity raises the question of the importation of food or electricity instead, linking water security into the food and energy security nexus. This situates the South African water management challenges in the context of regional integration and regional development: looking beyond our borders may enable the more effective resolution of water challenges.

2.4.5 Public awareness of water

Over the past twenty years, public concern over water issues has been rising, both globally and in South Africa. The coverage of water issues in the media makes it clear that sustainable water management is increasingly under public scrutiny, whether driven by public health, business, or environmental concerns. As the public concern over water management rises, there is greater pressure to ensure that effective financial arrangements for the necessary infrastructure and management of the sector. There is also greater pressure to ensure engagement with the public over matters such as the development of the pricing strategy, the financing arrangements for infrastructure, and the arrangements for economic regulation and how this is to protect the interests of the public.

2.4.6 Corporate engagement with water

Just as the public concern over water has increased in recent years, so has concern risen in the private sector about the increases in water-related risk to business. As a result, the corporate sector, globally, has put in place a number of processes to examine water-related risk and how best to mitigate such risk, particularly in developing countries. In the South African context, a number of

the large companies have been engaging actively with the issue of water risk. This interest also comes with challenges, such as the strident call for the introduction of water markets and full economic pricing of water. The increasing interest by the global investor community and financial institutions in water risk, governance and pricing also raises the stakes around foreign investment and perceptions of risk.

2.4.7 Shifting water resources management paradigm

As water use has shifted over the past decades, so too has the focus on water management shifted. There has been an evolution of water management focus from largely water resources infrastructure development to a balance with water resources governance. Similarly, there has been a shift from financing large infrastructure through public funds to a mixed financing approach where large infrastructure is financing through a mixture of public and off-budget financing. The understanding of this shift is critical to the revision of the pricing strategy and the development of appropriate infrastructure financing models. This shift is fundamental to the intent of the Water for Growth and Development paradigm.

2.4.8 Nature of the challenge over the next 5-10, and then 20 years

With increasing stress (scarcity and deteriorating water quality), the management of South Africa's water resources will require improved regulation (governance associated with resource protection and use), together with sound management (operation, maintenance and refurbishment) of existing infrastructure, and the development of new infrastructure (particularly for urban development, industrial requirements and rural livelihoods). Financing models need to consider these as distinct functions, with specific imperatives and constraints and potentially requiring separate funding sources, but at the same time approach these as aspects of the whole management imperative.

2.4.9 Municipal service delivery challenges

Finally, there are major challenges at the municipal level in relation to water services delivery. These include poor maintenance and refurbishment of infrastructure resulting in increasing interruptions in supply and high levels of unaccounted for water, poor management of wastewater treatment works, resulting in deteriorating raw water quality in receiving water resources, slow delivery of sanitation services, and unaffordable technology choices in some areas. These challenges are compounded by inadequate cost recovery in the water services sector. Despite significant funding of water services through, inter alia, the equitable share and MIG, there is evidence that an inadequate proportion of the equitable share is actually spent on water services. In addition, billing and cost recovery are generally poor, with some areas in essence not being billed at all. This has the result that daily operations and longer term maintenance, in particular, are significantly under-funded.

The results of poor municipal water management are demands for increased quantities of water and decreasing raw water quality, both of which have major implications for water resources management, with associated financial and regulatory implications.

2.5 Water Resources Infrastructure Financing

2.5.1 Inadequate recovery for depreciation and refurbishments

The current general under-recovery of funds for depreciation and refurbishment (in all regions other than Western Cape and Gauteng), together with inadequate ring-fencing of budgets, poses a significant challenge to infrastructure management and has contributed to the refurbishment

backlog. The increased operation and maintenance budget requirements of the proposed infrastructure (see Figure 2-5) further highlights this issue. The long term resilience of the South African water economy and society depends upon functioning infrastructure, which requires rectification of this challenge.

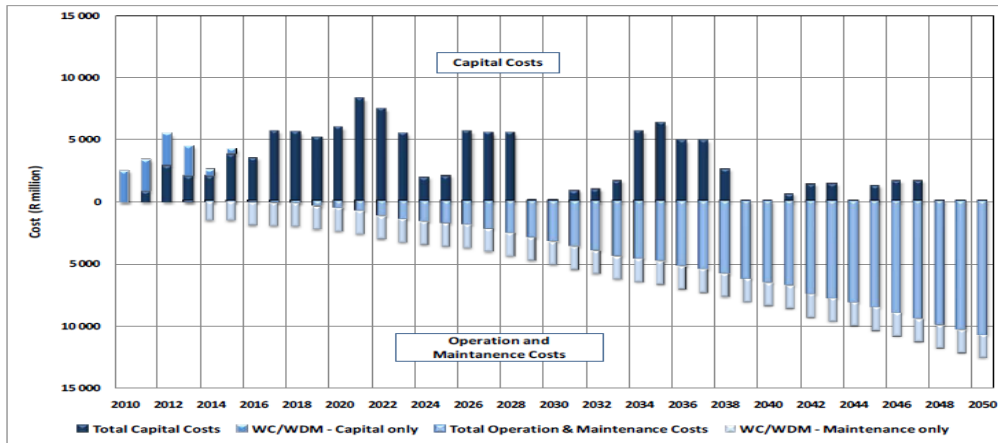


Figure 2-5 DWA water resources infrastructure costs

2.5.2 Projected infrastructure development needs

The above figure also indicates that in excess of R60 billion will be required for national and regional water resources infrastructure development over the next 20 years. The delays in decision making around infrastructure development in many parts of South Africa (particularly for Durban, Gauteng and Western Cape) have imposed significant risk on the country over the next 5 to 10 years. Innovative financial and institutional models will be required to ensure that this situation is not repeated into the future. These models will also need to take into account the fiscal constraints that the country is facing. A further important consequence of this is that water conservation/demand management measures are necessary to close the supply gap in the short to medium term, which implies that financing of WC/DM measures needs to be considered in financing water resources reconciliation.

2.5.3 Demand management investment

As has been mentioned above, the financing of water conservation and demand management is a critical element of sustainable water resources management in the country. While some WCWDM initiatives are relatively low cost, others, such as the refurbishment of municipal infrastructure and the lining of irrigation canals, require significant capital outlay. The current demand driven WCWDM funding approach is not working well and the model for infrastructure funding should consider the financing models for treating WCWDM as infrastructure-related augmentation. Mechanisms to ensure effective water demand management with quick payback periods need to be found.

2.5.4 Water resources infrastructure for water quality management

In addition to infrastructure for augmentation, there are major challenges in relation to managing water quality, some of which require infrastructure based solutions. This is particularly true in relation to the management of acid mine drainage. The financing of infrastructure and the pricing strategy will need to encompass these requirements. A waste discharge pricing strategy has already been developed and is being implemented, but will need revision and alignment with the financing model.

2.5.5 Holistic reconciliation approach

Going forward, an integrated approach to reconciliation of supply and demand will be required in South Africa that takes account of measures to control urban and industrial demand, consider productivity and efficiency gains in agriculture and adopt innovative supply options together with more traditional large infrastructure systems. This is the key message behind the 2030 WRG cost curves and underlies the approach to the recent DWA reconciliation strategies. A possible conclusion of this management recognition is that the financing models must also engage and be flexible enough to enable more innovative solutions.

2.5.6 Balancing equity, development and environment

As has been mentioned, South Africa is one of the most unequal societies in the world, with extremely high levels of poverty. There is a pressing need to create decent jobs, and to eradicate poverty. This should not be done, however, in an environmentally unsustainable way. Thus the financial model and the economic regulation must be sufficiently nuanced to balance a number of different drivers, particularly the need to achieve social equity and redress, the need for economic development, and the need to protect the aquatic environment. Balancing these three factors will support the Constitutional requirement for ensuring both environmental protection and socially justifiable economic development. The pricing strategy and the economic regulator must address all three of these elements.

2.5.7 Challenges of the water services supply

While the norms and standards for water services tariff determination are constitutionally, legally and institutionally distinct from raw water pricing, there are considerable interfaces and opportunities to align funding and revenue sources for these two areas. Importantly, the majority of the existing water resources infrastructure revenue is billed from water services authorities (and ultimately their customers), while most of the future water resources infrastructure development will be for municipal and industrial users. Importantly, any failure along the water value chain results in failure of supply or waste discharge. Thus ensuring alignment is critical both for water services viability and for the sustainable financing of water resources infrastructure in South Africa.

Failures in municipal water services billing and revenue generation are an increasing risk area for water boards, catchment management agencies, and DWA. Annual arrears by municipalities to DWA and water boards have been significant (over R2 billion at 30 April 2012). They highlight the risk factors that must be taken into account in financing infrastructure and in determining raw water prices.

2.5.8 Institutional uncertainty and off-budget financing

Off-budget financial models require appropriate institutional vehicles (such as the TCTA) to access commercial sources of finance. The institutional realignment made proposals on the appropriate institutional arrangements to manage and develop the national water resources infrastructure, as well as the role and number of water boards. The optimal model for the financing of water resources should leverage the existing infrastructure and associated cash flow to access non-project bound finance, but this requires the institutional ring-fencing of these assets. The resolution of the institutional arrangements is particularly important in developing appropriate models for off-budget financing of infrastructure.

2.5.9 The nature of risk

There are a number of risk areas that must be considered in the development of infrastructure financing models. These include financial and revenue risks; institutional uncertainty risks; and longer-term system risks arising from changing climate-hydrological and development-economic conditions. Understanding of exchange rate and financial market risks is fundamental to the critical evaluation of the exposure that different models impose on the South African government.

2.6 Final considerations

In summary of this context, it is worth considering the conclusions of a paper written for the 2010 OECD review of water resources financing. These provide a useful reference in thinking about raw water financing in South Africa.

- *Pro-poor water resources management requires investment by the state in local infrastructure to support rural development, which in reality will be largely focused on agriculture. Requiring the formal economy to pay the full financial costs of water infrastructure releases state resources to focus on those communities that cannot afford to pay for the full costs of this investment.*
- *Commercial funding of economically-driven infrastructure provides an important mechanism to optimally use state resources. However, the need for long-term project supply agreements to be signed by economic users as a condition for funding, poses challenges in basins with multiple, changing users or unidentified future users, even where a compelling case can be made for economic development.*

In conclusion, the findings of the Camdessus Panel, with respect to infrastructure investment, are still relevant to the debate. They highlighted the following challenges that remain relevant today:

1. Governance issues – such as political interference, confusion between economic, social and environmental aims, an inadequate general legal framework, non-existent or weak regulators, and resistance to cost-recovering tariffs.
2. Commercial unsuitability – such as high capital investment followed by modest positive cash flows; low rate of return; foreign exchange risk resulting from a mismatch between local currency earnings and foreign currency financing; sub-sovereign risk comprising the responsibility being with local entities that lack financial powers, resources and credit standing; risk of political pressure on contracts and tariffs and absent, weak and/or inconsistent regulation; and contractual risk occasioned by projects of long duration being entered into with poor initial information.

Key recommendations arising out of the subsequent Gurria Task force and other analysis was to strengthen governance and to improve access to local capital markets (to reduce the foreign exchange risk).

2.7 Problem statement

Section 5.3 below illustrates how it has been calculated that water infrastructure investment of R350 billion to R650 billion is required over the coming 10 years. This is for rehabilitation, upgrading and new infrastructure. All indications are that there is a challenge in finding the capital and revenue to finance this investment.

Added to this capex requirement is the need to adequately maintain and operate existing and new infrastructure. Currently there is significant under-recovery and misallocation to fund operations, maintenance and refurbishment – let alone betterment and augmentation.

To sum up the problem: there is an urgent need to address the under-investment and under-recovery for South Africa's water infrastructure – both in terms of rehabilitation (and upgrading) and new build. Traditional sources of finance are not sufficient to meet the capital and operating requirements.

At the same time it is necessary to understand the context within which the additional financing is required, with challenges ranging from institutional capacity to the changing nature of South Africa's economy. Some of these challenges and considerations are expanded upon below. For the purposes of this report, the problem statement is narrowly defined as the financing gap that exists between what is required to finance capital investment in water infrastructure, as well as the subsequent operations and maintenance thereof, and the finance that is currently available.

The purpose of this report is to identify the financing mechanisms used by other institutions in South Africa and internationally, and to develop a set of principles that can guide the choice of appropriate financing mechanisms for South Africa's water sector.

3 South African Approach to infrastructure finance

Before looking at sectors and existing South African infrastructure agencies, and the approaches that they have adopted to finance public infrastructure, it is worth reviewing the recently launched national Infrastructure Plan.

3.1 Debate on South Africa's general approach to infrastructure finance

3.1.1 South Africa's Infrastructure Plan

The South African Government has recently adopted an Infrastructure Plan with the aim of transforming the economic landscape of South Africa, creating jobs, strengthening the delivery of basic services, and supporting the integration of African economies. Cabinet has established a body, the Presidential Infrastructure Co-ordinating Commission (PICC) to integrate and co-ordinate the long-term infrastructure build. PICC has identified infrastructure gaps, population movement and economic performance within a special framework and have thus developed seventeen Strategic Integrated Projects (SIP) to address the country's needs, as well as a more comprehensive 'Infrastructure Book' of 645 projects. The SIPs encompass economic and social infrastructure throughout South Africa. Cabinet and the PICC have approved an implementation framework which sets out a plan for each SIP.

Some key projects featuring in the Strategic Integrated Projects:

- South Eastern node and corridor development:- promote rural development through a new dam and irrigation systems at Umzimvubu;
- Unlocking the economic opportunities in North West Province:- acceleration of identified investments in bulk water and water treatment and transmission infrastructure in order to meet basic social needs;
- Integrated Municipal Infrastructure Project to assist the 23 least resourced districts to address all the maintenance backlogs and upgrade required in water, sanitation and electricity bulk infrastructure.
- Agri-logistics and rural infrastructure, including providing irrigation schemes to poor areas and supporting aquaculture incubation schemes
- Regional Integration for African cooperation and development:- partnering with African economies growing at a fast pace with projected growth ranging between 3% and 10% to unlock long-term socio-economic benefits. These projects encompass transport, water and energy and provide competitively priced diversified options for the South African economy e.g. electricity transmission project in Mozambique could assist in providing cheap, clean hydropower.

Considerations to be taken into account in devising appropriate financing strategies as per the Economic Development Conference on Infrastructure:¹

- Financing will take into consideration off balance sheet mechanisms to attract private sector equity, debt and participation.
- Assess the capacity of both domestic and international financial markets

¹ Economic Development, Conference on Infrastructure A summary of the Infrastructure Plan, April 2012

- Assess the capacity of Government to provide guarantees, loans or equity (where tariff income is insufficient)
- Consider the ability to attract foreign debt and equity financing taking into account country limits, country risk etc.
- Innovative financing like retirement funding (as equity) should be considered
- PPPs should transfer equitable risk to private sector appropriately.

3.1.2 National Development Plan

The National Development Plan was released in November 2011 and will formally be tabled in September 2012. The plan seeks to eliminate poverty and reduce inequality by 2030 by focussing on areas such as promoting health, creating jobs, transforming education, improve the functioning of the state, expanding infrastructure etc.

The development plan may adopt a different stance to the government on certain issues, but it dovetails with existing state programmes e.g. expanding infrastructure. The plan for the water sector is to set up an investment programme for water resource development, bulk water supply and wastewater management with reviews every five years.

Finance Minister Pravin Gordhan met bank officials in August 2012 to discuss the role that banks could play in solving the country's socio-economic problems. The banks indicated their support for the National Development Plan, and identified that they could be key players in financing the important infrastructure projects.²

A significant challenge however is the skills shortage in South Africa especially engineering skills in the public sector which is impacting the delivery of infrastructure.³

3.1.3 Department of Public Enterprises Division

In August 2012, Public Enterprises Minister Malusi Gigaba announced a special division within the department that was formed in July 2012. This division will focus on innovative financing models to support the investment programmes of South Africa's state-owned companies focussing on Transnet and Eskom. These include using major customers of state-owned companies "to provide balance sheet support for big projects, particularly when a few companies make up the dominant users of the infrastructure".⁴

3.2 Energy - Eskom

Eskom is a state-owned company wholly owned by the South African government. Eskom generates approximately 95% of the electricity used in South Africa and 45% in Africa. Eskom is responsible for generating, transmitting and distributing electricity to customers in the industrial, mining, commercial, agricultural, and residential sectors and to redistributors. Thus Eskom's operations have

² Treasury: Improve access to banking, *Business Report*, [online] Available at: <<http://www.iol.co.za/business/business-news/treasury-improve-access-to-banking-1.1370676#.UDxqmMGUoXs>> [Accessed 29 August 2012].

³ Allix, M., 2012. SA 'lacks skills' for state's build spend, *Business Day*, [online]. Available at <<http://www.bdlive.co.za/national/labour/2012/08/29/sa-lacks-skills-for-states-build-spend>> [Accessed 29 August 2012]

⁴ Donnelly, D., 2012. Big customers may fund parastatals' projects, *Mail & Guardian*, [Online] Available at <<http://mg.co.za/article/2012-08-24-00-eskom-grilled-on-power-price>> [Accessed 24 August 2012]

a macroeconomic impact beyond the energy sector. The Infrastructure development is aligned with national planning and economic development initiatives.

Eskom is regulated under licences granted by the National Energy Regulator of South Africa (NERSA) in accordance with the Electricity Regulation Act (4 of National Energy Regulator of South Africa (NERSA) 2006) and receives revenue based on NERSA-approved set tariffs.

A capacity expansion program was implemented in 2005 which aims to increase Eskom's generation capacity and transmission lines. The current build programme is up to the year 2018 and entails maintenance, refurbishment and technical planning projects to enhance plant performance ensuring that the existing infrastructure accommodates the current demand as well as to diversify the energy sources. Additional power stations and major power lines are being built. The program has cost R140 billion up to 31 March 2011 and is estimated to cost approximately between R450 billion and R500 billion (excluding capitalised interest) up to 2017.

Eskom plans to obtain R430 billion from the South African Government, and R40 billion per year over the next three years in loans from local and international debt capital markets and development finance institutions (DFIs) such as the European Investment Bank and the World Bank. Eskom has secured financing from the African Development Bank (ADB) and the Clean Technology Fund (a climate investment fund that promotes the transfer of low carbon technologies) for the Sere Wind farm and the Upington solar plant project. The loans are guaranteed by the South African government.

3.3 Transport

The Department of Transport has created two major public entities to manage transport infrastructure in South Africa: Transnet and SANRAL.

3.3.1 Transnet⁵

Transnet is a wholly owned State enterprise operating a network of rail freight, ports and pipeline assets across South Africa. Transnet's mandate and strategic objectives are aligned with Government's New Growth Path (NGP) and the Statement of Strategic Intent (SSI) issued by the Minister of Public Enterprises.

⁵ Transnet annual report,2010

The National Energy Regulator of South Africa (NERSA) sets tariffs for Pipelines, while the Ports Regulator of South Africa (Ports Regulator) regulates National Ports Authority.

Transnet has embarked on a growth strategy where Transnet plans to invest R110.6 billion on infrastructure developments for the five year period 2012 to 2016. Transnet have a self-financing method where they rely on the strength of their balance sheet without reliance on government subsidies or guarantees.

The main source of financing is the commercial paper programme and long-term bonds which are part of the Domestic Medium Term Note (DMTN) programme. The other sources of financing include export credit agencies, Development Finance Institutions (DFIs) and international bonds under the Global Medium Term Note (GMTN) programme. Loans from the Development Finance Institutions are used to finance specific projects, commercial paper for short-term needs and the export credit agencies to finance imports.

Due to the major projects planned, Transnet are also looking at innovative means of obtaining financing. These include asset backed financing to finance equipment and Private Sector Participation (PSP), Public Private Partnerships (PPP), project finance, leasing and syndicated loans to finance the large projects.⁶

Sanral is a state owned entity established in 1998 and is accountable to parliament via the Minister of Transport. The organisation is responsible for South Africa's large network of non-toll roads and toll roads. National Treasury finances all non-toll roads and capital and money markets are the main source of financing for the toll-roads.

Gauteng Freeway Improvement Project

The plan was to repay the loans as well as cover the future operation and maintenance of these roads via the user-pay principle by an electronic and automated method referred to as e-tolling.

However, in April 2012, the High Court in Pretoria ordered the suspension of the start of tolling on GFIP, pending a review of the decisions to toll those freeways. This halting on collection of fees has had serious implications for Sanral. Treasury has provided a three year term loan. But the loan is not sufficient and the enterprise has had to explore alternative financing mechanisms to ensure that they are able to meet the debt obligations as they mature. These include monthly auctions, international financing, BOT and PPP opportunities.

⁶ Transnet expansion to fund itself, Rising Revenue to repay 70% of investment, Business Report, 9 May 2012

4 International Experience – Case Studies

Appendix B provides a detailed analysis of financing mechanisms used in various countries – especially those where innovative methods have been used or where there are similar institutional arrangements to South Africa. Highlights from the review are summarised below.

4.1 China

In China, direct fiscal support is declining. In recent years, central and local governments have tended to assign a larger role to debt instruments. State-owned commercial banks and policy banks⁷ hold around 80 % of total infrastructure loan portfolios, and bank financing accounts for more than half of total infrastructure financing.⁸

Local governments are actively involved in financing infrastructure projects. They provide guarantees (implicit and explicit) for bank loans to infrastructure projects. In some cases, they provide subsidies directly for infrastructure SPV's.⁹

Corporate bonds have become more important, but remain a small share in total financing as the bond market remains underdeveloped. These bonds are guaranteed by public banks or other associated companies increasing credit ratings to levels that allow commercial banks and insurance companies to invest.

Local governments in China are not allowed to borrow directly. However, municipally owned utility companies are allowed to borrow from the China Development Bank, other Chinese banks and international financial institutions (World Bank, Asian Development Bank (ADB) and bilateral donors such as the Japan International Cooperation Agency (JICA) and the German KfW. In regions that are not economically developed, the local governments can enter into State bond programs. The bonds tend to have long maturities and low interest. They are issued by the Ministry of Finance, and then distributed by the National Development and Reform Commission.

Private sector participation in financing infrastructure and managing services is widespread. In 2007 there were over 50 water projects and well over 100 wastewater projects in China with private sector participation.

One of the innovative financing models in the water sector is the Hyflux Water Trust (HWT). This is an example of using equity stakes to leverage other forms of financing. The trust was launched on the Singapore stock exchange in 2007. The trust is 31.5% owned by Hyflux (also listed on the Singapore exchange) and the rest by the public. Hyflux's main activities include development, manufacture, and sale of water treatment and desalination plants, as well as installation and commission of systems. The HWT is responsible for operating and managing all of Hyflux's BOT contracts and has the right of first offer and first refusal for all new projects. This arrangement

⁷ Policy banks were established in 1994 to take over the government directed spending functions of the state owned commercial banks. These banks, the Agricultural Development Bank of China (ADBC), China Development Bank (CDB), and the Export-Import Bank of China (Chexim), are responsible for agricultural development projects in rural areas, infrastructure financing and trade financing respectively.

⁸ IMF Working Paper, Asia and Pacific Department, Financing Infrastructure in India: Macroeconomic Lessons and Emerging Markets. Case Studies, James P. Walsh, Chanho Park and Jiangyan Yu, August 2011

⁹ *ibid*

enables Hyflux to pursue an “asset light” capital structure. This thus frees up the capital invested in plants and Hyflux is able to develop new projects.¹⁰

The Three Gorges Dam is the largest hydroelectric dam in the world. The China Development Bank has been the main lender, loaning \$3.6 billion. Government export credit agencies loaned the project \$1.4 billion. The remainder of the financing has been funded internationally by companies, export credit agencies and banks from Canada, Switzerland, Germany, France, Sweden and Brazil.¹¹

4.1.1 Lessons learnt

The primary lesson appears to be that China has funded its water infrastructure development by moving away from direct fiscal support to instead placing increasing reliance on bank loans – both local and international, both commercial and concessionary (or at least developmental).

It appears that the State’s role has changed during this transition, from direct funder to the provider of subsidies, guarantees, concessions and partnerships. A benefit of this changing role is the ability to leverage a far greater infrastructure spend than would be possible if financing everything internally.

4.2 Philippines

The Philippines has predominantly financed their water infrastructure from government loans.

There are many small institutions in the Philippines water sector with different regulations, insufficient autonomy, lack of co-ordination and co-operation, and political interference which has resulted in a lack of accessible, timely and uniform information from one source. This lack of financial transparency and the low creditworthiness has led to limited investor interest and thus limited international financing.

In recent years, the government of the Philippines has been trying to obtain other sources of finance and has been trying to establish a framework for attracting private-sector finance. The government has established a PPP framework that provides guarantees for contractors and concessionaires against regulatory risk.¹² The Local Government Unit Guarantee Corporation (LGUGC) was established to provide credit guarantees for municipalities that seek to finance infrastructure projects through debt issuances.¹³ The primary mandate of LGUGC is to provide LGUs access to private capital by providing credit enhancements to LGU debt. This enables LGU’s to enter the capital markets. LGUGC has a co-guarantee agreement with the US Agency for International Development (USAID).¹⁴ This reinsurance strengthens LGUC’s ability to co-ordinate private capital lending for water supply and sanitation facilitates in the Philippines.

¹⁰ Innovative financing mechanisms for the water sector, OECD report 2010

¹¹ The Three Gorges Dam Project Funding, <http://www.mtholyoke.edu/~lpohara/Pol%20116/funding.html>

¹² Emerging Markets, News, Analysis and Opinion, Infrastructure: Changing Lanes, 05/05/2011, Nicholas Lord

¹³ Platz, Daniel (2009), Infrastructure finance in developing countries—the potential of sub-sovereign bonds, DESA Working Paper No. 76ST/ESA/2009/DWP/76

¹⁴ <http://www.lgugc.com/about.htm>

In 2004 as per the Executive Order (EO) 279, creditworthy water utilities were mandated to start using market-based financing and not government based financing.¹⁵ This led to the Philippine Water Revolving Fund (PWRF) being initiated which leveraged government funds, Official Development Assistance (ODA) funds and private sector funds. The objective of this initiative was to improve the governance and efficiency of the water sector. This initiative targeted three areas that were considered to be a hindrance for private financial institutions (PFI's) to enter the water sector. The three risk areas identified were credit risk, operational risk and political risk.

In order to address the credit risk aspect, the PWRF focussed on improving potential creditors' understanding of the water utility business models by providing nationwide training on how to evaluate water projects. In addition to this, the PWRF and the LGUGC created a risk rating system whereby water utilities were empowered to understand how to improve their credit scores and how to access cheaper financing as well as providing the PFIs with a comprehensive understanding of the water utilities' credit worthiness. PWRF also enabled water utilities to obtain affordable lending terms by blending concessional and PFI financing. This was done by a co-financing arrangement mixing public and ODA funds, re-lent through the Development Bank of the Philippines, with internal funds from PFIs.

PWRF aimed to increase the operational strength of the utilities to enable them to be more attractive to PFIs. Utility reforms included training utilities to draft viable business plans, training in project development and establishing the Water Operations Partnership (WOP) Programme. WOP was pivotal in its role through knowledge sharing, mentoring, and benchmarking in areas such as water quality and strategic planning.

4.2.1 Lessons learnt

The Philippine Water Revolving Fund (PWRF) reform was a gradual process and highlighted the importance of innovative financial mechanisms but more importantly the fact that in order for a reform to be successful, a strategic and regulatory reform is necessary. The financing reforms in the Philippines have been accompanied by policy reforms like strengthening regulation and institutions. These reforms have been successful in attracting the private sector by identifying and addressing the three risk areas of credit risk, operational risk and political risk. These risks were addressed by having a multifaceted approach of training, institutional strengthening, better credit ratings and blending different financing mechanisms to obtain affordable lending terms.

4.3 Mexico

At present, the lack of cost recovery through user fees is one major impediment to meeting investment needs in the sector. As a result, third-party financing is difficult to raise, and the sector therefore relies almost entirely on government subsidies to meet its investment needs.

Mexico has a complex, decentralized institutional framework for managing and investing in water resources. The Federal Government provides most funds for managing water resources, but many decisions regarding allocation of funds and infrastructure planning take place at the sub-national level, including states, municipalities, and river basin committees.

¹⁵ Jeremias N. Paul, Jr, Making Water Reform Happen: The experience of the Philippine Water Revolving Fund, October 2011

Mexico has taken some steps to introduce commercial financing, but overall use of private sector participation (PSP) has been concentrated in wastewater treatment plants, and subnational financing is not generally accessed directly by water and sanitation providers.

Mexico has one of the best-developed sub-national bond markets in the developing world. This is supported by legislative structures – for example states and municipalities must establish a trust for repaying general obligation bonds, which is funded by the federal “tax participation” payments collected by the national government and redistributed to states and municipalities. These funds, earmarked for debt repayment, are isolated from local governments’ general accounts, leading to lower borrowing costs than would be achieved without the trust.

Notwithstanding the well-developed bond markets, these have not been a significant source of direct financing for the water sector. Water utilities have not been able to borrow on commercial terms, given the inability of most water utilities to recover costs. Instead, the bond issuance is often a source of general financing for local governments, which in turn use the proceeds to subsidize water investments.

In order for commercial finance to be a viable source of financing for the water sector, cost recovery and efficiency would have to improve. One way to improve the incentives for cost recovery and efficiency would be through greater private-sector participation.

The State of Quintana Roo, with the support of USAID/EDI Global Development Alliance Program, created a bond bank in 2006, the Quintana Roo (QR)-Bond Bank. The QR-Bond Bank is a pooled financing vehicle which intercepts different revenue streams and pledges them to pay for debt obligations, so as to increase the credit rating of the borrowing entity.

In October 2007, the QR-Bond Bank helped the State Commission for Water and Sanitation (Commission de Aqua Potable y Alcantarillado, CAPA) to access an amount – in local currency equivalent to USD 30 million dollars – from the domestic capital markets. Terms and Conditions were unprecedented in Mexico for a water entity. The bank loan from Citibank had a 15 year term and was provided at inter-banking rate plus 19 basis points on the back of a transactional rating of AA.mx, when other water utilities in Mexico were hardly obtaining any financing or only through short term loans (approximately 3 to 6 years) at 400 to 600 basis points over inter-banking rate. The Federal Government matched this financing by providing another USD 30 million.

The bond bank helped overcome a number of constraints that had been preventing the State of Quintana Roo from building an effective and consistent financing framework in the water and sanitation sector. Water utilities are not considered as federative entities and therefore receive no national tax transfers. Water Bill collection rates are relatively low, as the Federal Constitution of Mexico guarantees water supply to citizens, even if they do not pay for it and the culture of non-payment for infrastructure services is widespread. In spite of the continued focus and improved management of payment levels, this means that revenue streams are not perceived as secured by potential investors. Finally, the Mexican municipal bond market in general lacks enough credit insurance products for potential municipal issuers. In an arena where municipal credit ratings are

low compared to domestic investment grade standards, credit enhancement becomes a key necessity.¹⁶

In Mexico, the use of private sector participation (PSP) contracts in the water and sanitation sector has been limited. CONAGUA and two banking partners are working with a number of municipalities to develop and implement contracts for Integrated Management Improvement. The objective of this new type of contract is for the private operator to directly manage the utility—thereby leading to increases in operating efficiency—and also to provide financing for capital investments. The Federal Government will provide grants to cover 40% of total investments required, whilst the private company is responsible for contracting and repaying the debt (35% of total investment requirements). Debt service will be covered through payments from the contractor (a municipality). The equity contribution (25% of total investment requirements) will be recovered through payments from the contractor as the private operator meets objectives for efficiency improvements.

The establishment of the National Infrastructure Fund (**FONADIN—Fondo Nacional de Infraestructura**) is the Government's main reform effort to reduce costs by mobilizing private funds for developing infrastructure. The Mexican Government created FONADIN in 2008 as a vehicle for financing investments in water and other infrastructure. Private companies must invest equity for a project to be eligible for receiving financing from FONADIN.

FONADIN can provide financial assistance either as grants or reimbursable support. The reimbursable support can include funding of studies, guarantees (such as loan guarantees, performance guarantees, and political risk guarantees), subordinated and/or convertible loans, and even equity contributions. The non-reimbursable support can be provided through contributions or subsidies. Contribution can be used to cover the costs of studies or consultancies or the costs of developing infrastructure projects with a high degree of social return. These projects must incorporate private sector participation and have their own source of revenues. Subsidies are awarded to achieve financial equilibrium in projects that are expected to have a high social return, but with low financial returns.

Government entities as well as private companies are eligible to receive support from FONADIN. To be eligible private companies must be the beneficiaries of concessions, licences or contracts that permit public-private partnerships. To date, FONADIN has approved over US\$1.5 billion in financing for projects in water and sanitation. The largest of these is the Atotonilco wastewater treatment plant for a sum of about US\$700 million.

4.3.1 Lessons learnt

There are many similarities with South Africa – namely the high reliance on financing from central government, and the increasing push to access commercial sources for the financing of water infrastructure. Interesting lessons that can be learned from the Mexican experience include the establishment of the National Infrastructure Fund, and its requirement that projects must include a portion of private equity to be eligible for access to the Fund.

¹⁶ Innovative Financing Mechanisms for the Water Sector – OECD 2010

The focus on improving efficiency and revenue collections highlights the same challenges that face South Africa, and the importance of addressing these two issues, given the impact they have on accessing further financing. Mexico's approach, through its PROMAGUA program, is to introduce more private sector involvement in the management of water utilities. Naturally this requires well managed contracts with the appropriate balance between commercial profits and profit-driven cost savings.

4.4 Investment in Africa

4.4.1 Overview

It has been difficult obtaining international financing in most African countries, due to the low credit worthiness (low or no sovereign credit ratings) and the limits of local financial markets. The regulatory and political interference in infrastructure development has also been a deterrent.

In Countries such as Cameroon, Nigeria and Tanzania, macroeconomic and institutional changes and financial sector reforms have been shown to increase longer-term local currency financing for banks and therefore increase local bank financing for infrastructure projects.¹⁷

4.4.2 Chinese investment model¹⁸

The Chinese investment model has become a major force – especially in Africa and Eastern Europe. Recent years have seen growth in the financing activities of “emerging partners” with China being by far the largest. By 2006, the investment by emerging partners in African infrastructure roughly equalled the investment channelled through Overseas Development Assistance (ODA) and that of the private sector. The conditions attached to these investments are commercial and there is no attempt to influence the policies of the host nation. Most investment is channelled through an export – import agency. It is sometimes characterised as the “Angola Model” where natural resources are used to secure debt and even to repay it directly. Most of this financing has gone to railways and hydropower with no identified projects in the water services sector.

By the end of 2007, China was providing at least US\$3.3 billion toward the construction of 10 major hydropower projects amounting to more than 6,000 megawatts (MW) of installed capacity. If completed, these schemes would increase the total available hydropower generation capacity in sub-Saharan Africa by around 30 percent. Water and sanitation account for a relatively small share of China's total financial commitments to African infrastructure development. Participation in confirmed projects was about US\$120 million, and another estimated US\$200 million went into Angola's water sector as part of the China Ex-Im Bank credit line of 2004. Most of these projects were smaller scale in nature and more focused on meeting immediate social needs. China's water supply projects include a number of smaller dams that are not related to hydropower but directly to water supply, in Cape Verde and Mozambique.

Unlike traditional ODA, Chinese infrastructure finance is channelled not through a development agency but through the Ex-Im Bank, which has an explicit mission to promote trade. Given the

¹⁷ Financing Infrastructure in Africa, How the region can attract more project finance, Gridlines, Note No.13, Sept 2006

¹⁸ World Bank: Building Bridges: China's Growing Role as Infrastructure Financier for Sub-Saharan Africa. Trends and Policy Options. No.5. 2008.

export promotion rationale, the tying of financial support to the participation of contractors from the financing country is a typical feature. A similar approach is being taken by the India Ex-Im Bank and has in the past been used by export credit agencies of other countries.

Ex-Im Banks provide credits to buyers and exporters to support the trade of goods. These credits include the provision of loans, concessional or otherwise, for the building of infrastructure. The China Ex-Im Bank is increasingly making use of a deal structure— known as the “Angola model” or “resources for infrastructure”—whereby repayment of the loan for infrastructure development is made in terms of natural resources (for example oil). This approach is by no means novel or unique, and follows a long history of natural resource-based transactions in the oil industry. In the case of the China Ex-Im Bank, the arrangement is used for countries that cannot provide adequate financial guarantees to back their loan commitments and allows them to package natural resource exploitation and infrastructure development.

The China Ex-Im Bank’s terms and conditions are agreed on a bilateral basis, with the degree of concessionality depending on the nature of the project. On average, the Chinese loans offer an interest rate of 3.1 percent, a grace period of 4 years, and a maturity of 13 years. However, there is significant variation around all these parameters across countries with interest rates ranging from 1 to 6 percent, grace periods from 2 to 10 years, and maturities from 5 to 25 years.

4.4.3 Ethiopia

The government of Ethiopia has embarked on a determined dam building program to address the problems of power outages experienced in the country. In 2009 less than 10% of Ethiopians had access to electricity and the country was plagued by power outages.¹⁹ The poverty in the country is quite high resulting in low demand for power, thus plans to export power to Sudan, Kenya, Yemen and Egypt. The dams are designed to provide water for irrigation and flood control but mainly for hydropower. Ethiopia has a high hydropower potential. Hydropower is nearly the only economical, feasible and reliable source of power supply in the country.

The power utility in Ethiopia is the Ethiopian Electric Power Corporation (EPCO). The utility is doing well in terms of collecting revenues, however the problem encountered is that the power tariffs are extremely low and this under-pricing only recovers 46% of the costs of the utility. In order for the utility to recover its costs and to function properly the tariffs would need to be increased.

The source of financing for hydropower in Ethiopia ranges from government grants, loans from capital markets, ODAs, financial institution loans and private funding.²⁰

4.4.4 Kenya

The Water Services Regulatory Board (WASREB), who regulates and monitors the urban and rural water service provision, is the most independent water institution in Kenya and generates approximately 72% of its funds internally. The Water Services Trust Fund (WSTF), established to provide financial assistance towards capital investment costs in areas lacking adequate services, has very limited self-generated funds and is approximately 67% financed by government and the rest by

¹⁹ http://en.wikipedia.org/wiki/Dams_and_hydropower_in_Ethiopia

²⁰ Baodong. H, Perspectives on Financing & Delivering Hydropower Schemes in Ethiopia

donor agencies. The water services boards generate a small percentage of the financing as most of their funds are from donor agencies or government.

Kenya has a well-developed microfinance sub-sector which has shown interest in the water sector. Kenya has undertaken a pilot project which uses an output based aid (OBA) approach to leverage co-financing from a private commercial micro-finance bank (K-Rep Bank Ltd). This project is supported by financial assistance from the Public Private Infrastructure Advisory Facility (PPIAF) and Global Partnership for Output-based Aid (GPOBA). The aim of the project is to minimize the need for grant finance in the development of infrastructure.

4.4.5 Zambia

The government of Zambia has established a Devolution Trust Fund to provide financing to water utilities based on proposals received from them as well as to water kiosks. The main financing in Zambia is however from donors and NGO's. The African Development Bank supports the seven local authorities' infrastructure rehabilitation projects. The Danish International Development Agency (DANIDA) assists Zambia with water supply and sanitation projects in rural and peri-urban areas as well as IWRM in Zambia. The German government-owned development bank, KfW, provides aid to Zambia via the Devolution Trust Fund (DTF) to the urban poor through water kiosks as well as providing aid for the construction of boreholes and hand-dug wells in the rural areas. Zambia also obtains financing from Ireland grants, the Japanese government agency, Japan International Cooperation Agency (JICA), grants for groundwater development and capacity building for utilities, UNICEF support of water supply projects and the World Bank.

4.4.6 Lessons learnt

Mitigating regulatory risk related to changes in exchange rates has proven to improve access to foreign financing for projects that are subject to regulation. Mitigating involves protecting projects against interference by regulatory agencies that would prevent tariff adjustments (as a result of matching cost increases caused by exchange rate movements). For example the partial risk guarantee against regulatory default that the World Bank granted for the concession of Uganda's electricity distribution company played a key role in attracting private investors.²¹

4.5 India

In India, water supply is a municipal function implemented by Urban Local Bodies (ULBs). ULBs are the constitutionally provided administrative units that provide basic infrastructure and services in cities and towns. The majority of urban infrastructure projects undertaken by ULBs depend on government funds and semi-public financial institutions that lend to ULBs relying on state government guarantees. These funds have however been decreasing and the Reserve Bank of India has been attempting to discipline lending against state guarantees. This has limited the flow of funds to ULBs for infrastructure projects and forced them to explore alternative sources of financing. Some of the innovative measures are PPPs and pooled financing.

The Credit Rating Information Services of India (CRISIL) and the Financial Institutions Reform and Expansion (FIRE-D) undertook a project to formulate credit ratings for ULBs. This project enabled

²¹ Financing Infrastructure in Africa, How the region can attract more project finance, Gridlines, Note No.13, Sept 2006

easier access to municipal bonds without state guarantees. The Ministry of Urban Development (MOUD) launched an initiative for the institutional credit rating of 47 ULBs by the Security and Exchange Board of India certified agencies. This initiative resulted in improved financial management of ULBs and attracted the public sector to finance urban infrastructure projects. However, small and medium ULBs found it difficult to access the capital markets based just on their balance sheet positions. Therefore, in 2006, MOUD formulated the Pooled Finance Development Fund Guidelines to help these ULBs access market funds for their infrastructure projects.

In the 1990's India undertook a few PPP initiatives but they were not successful due to the lack of political support and unaffordable tariff setting. In the early 2000s, the private sector started getting involved in setting up Water Treatment Plants (WTP) and Sewerage Treatment Plants (STP) and not just investing in basic water utilities. In recent years, PPP's have again become popular in the cities of India.

In Tamil Nadu, the Tamil Nadu Urban Development Fund (TNUDF) was set up as a PPP in order to provide sustainable financing for infrastructure investment. This fund was mainly used for municipalities with large and predictable revenue streams. The small ULBs had difficulty in accessing the capital markets due to the large transaction costs. TNUDF and the government of Tamil Nadu instituted an SPV called the Water and Sanitation Pooled Fund (WSPF). The Trust vehicle allowed the smaller municipalities to participate in the capital market and enabled private sector financing of infrastructure investments. A bond was issued by pooling 14 municipalities for water and sewerage infrastructure projects. This was the first municipal pooled issue. It had a fifteen-year maturity and an annual interest rate of 9.20%. The bonds were unsecured but a multi-layered credit enhancement mechanism was set up. The ULBs agreed to set apart monthly payments equal to one-ninth of their annual payments into escrow accounts and transfer the same during the tenth month into the WSPF's escrow account. USAID provided a backup guarantee of 50% of the bond's principal through the Development Credit Authority mechanism.²²

In Bangalore, the state government recruited FIRE-D to develop a market-based financing framework for Greater Bangalore Water and Sanitation Project (GBWASP). FIRE – D designed an innovative model of 'pooled finance' in which capital for the project was to be collected through beneficiary capital contributions (BCC), state loans, grants and debt raised through municipal bonds. A debt fund called the Karnataka Water and Sanitation Pooled Fund (KWSPF) was established under the Indian Trust Act to access the capital market by issuing a bond on behalf of the participating ULBs.

Other forms of obtaining finance in India include Design, Build, Own, Operate and Transfer (DBOOT) contracts in Chennai as well as concession agreements in Tirupur Town. Many utilities are taking small steps and handing out service and management contracts and undertaking pilot projects in small demo areas instead of awarding long-term concessions.

²² Urban Water Sector Reforms in India: Financing Infrastructure Development through Market – based Financing and Private – Public Partnerships, Sonia Ferdous Hoque, 10 February 2012

4.6 Summary of existing models and innovative thinking

As will be seen in the next chapter, current water institutions in South Africa rely heavily on government grants and guarantees. Globally there is a general trend to involve the private sector in bridging the financing gap in the water sector. However, market based mechanisms are difficult to mobilise due to a number of constraints namely weak institutions, affordability constraints in small water utilities, risk profile of local government, short tenure of financing and lack of understanding of the water sector by lenders. These factors all contribute to the water sector being seen to be a high risk area.

In order to improve access to finance, financing mechanisms need to be supported by parallel initiatives. These initiatives predominately address shifting perceptions to reduce the perceived risk of the sector.

4.6.1 Sources

Financing of infrastructure is usually sourced from government grants (locally through the fiscus or internationally through foreign aid) but can also be obtained in the form of equity (listed as well as private equity) and debt (commercial loans, loans from Export Credit Agencies or Development Finance Institutions or other bonds). The below are some important lessons learnt from the International and local case studies for sourcing finance.

- **Blending grants and innovative financing:** combine concessionary financing (grants or loans with a grant element) with repayable finance which combines the different financing mechanisms. This blending of funds attracts financing that the water sector would not have otherwise attracted and at the same time ensuring that public policy is met such as serving the poor.
- **Microfinance:** is a key way of overcoming affordability constraints for providing access to services especially for households and small scale service providers in developing countries.

4.6.2 Origin

An institution can obtain financing locally and/or internationally. More and more institutions like Eskom are tapping into the international market, especially the Asian markets and China specifically. Chinese trade and investment links with Africa have been growing rapidly and the interest shown in Africa has been heavily weighted towards resource-related projects.

The international and local case studies have provided the below lessons for obtaining financing.

- **Pooling of risk:** This provides easier access to the capital markets for a large number of small borrowers who tend to struggle obtaining financing on their own merit. Can be strengthened by having revenue agreements to either increase tariffs or intercept central government transfers that may be sufficient security to lenders. This helps in introducing financial discipline and supports the implementation of reforms at the local level. Helps build credit history and provides broader range of investors including commercial banks and equity investors.

- **Listed funds:** Similar to the concept of pooling risk in a group bond is the idea of listing a special purpose vehicle and mobilising equity via financial markets. Normally requires a recognised majority shareholder, who then provides the comfort for smaller investors.

4.6.3 Regulatory and legal framework

Strengthening the regulation and institutions within the water sector has proven to improve governance and establishes a good regulatory and legal framework that attracts external investors. In the absence of guarantees, the establishment of strong economic regulation balances short term political imperatives with the longer-term requirements for sustainable infrastructure financing.

4.6.4 Institutional strengthening and attractiveness

Having a multi-faceted reform process that encapsulates some of the factors listed below, increases the attractiveness of the institution to potential investors.

- **Training:** Improve overall transparency and knowledge of the sector for external financiers as well as train and support the development of local governments and utilities.
- **Credit ratings:** awarding credit ratings to municipal entities can improve transparency and facilitate access to capital markets. As was indicated in the Philippine concession case study it is easier to obtain financing on the back of a strong revenue performance and financial profile.
- **Guarantees and insurance products:** establishment of a guaranteed facility at national level to which IFIs and donors can contribute seed financing or overall guarantees could facilitate the provision of guarantees at local level. Institutions have tended to need guarantees initially on entering the market. Subsequent investments have tended to be made on the strength of their own balance sheets.

To summarise, the key role of national government is not just to provide financing, but to provide a stable environment. This may be through economic regulation, institutional strengthening, a stable legal framework, or financial guarantees. All of these serve to comfort investors and help to leverage the volume of financing to which the country will have access.

The issue of leverage is also very important. Countries such as China, Mexico and the Philippines have successfully increased total infrastructure spend by setting up national infrastructure funds. These national funds provide some, but not all, of the financing required for a project, with the rest coming from the private sector. Private investors are much more willing to get involved if they are not assuming the whole risk.

In Africa the management of regulatory risk has played a critical role in the success of infrastructure investment. This is especially true for commercial projects (especially hydropower) which rely on long-term projections for tariff income. If there is a risk of unexpected changes in these revenue streams, then it negatively affects the ability to attract upfront investment.

Finally, it is clear from both the international review and a review of local water sector institutions that there is still significant capacity for private sector investment. In many cases the utilisation of this capacity is being constrained not by the lack of finance, but by a lack of understanding relating

to how to access it and how to manage it. Training – of both the investors and the potential users – is therefore a key requirement.

5 SA Water sector

Within the context of the national infrastructure development drive, sits the SA Water sector and its needs. The mandate and governance structures of the sector are described in more detail below.

5.1 Mandate²³

Shortly after 1994, Prof Kader Asmal, then Minister for Water Affairs and Forestry, began an intensive and widely consultative process to reform the national policy and legislation governing water resources. This process resulted in the adoption by Cabinet of the White Paper on a National Water Policy for South Africa in 1997, and the promulgation of the National Water Act (Act 36 of 1998) a year later, both driven by the need to create more socially just, economically efficient and environmentally sound water management and allocation regimes in the country. This was a substantial deviation from the previous legislation which was largely focused on the allocation of water to the white irrigation, mining and industry sectors, and the control of pollution from mining and industry in particular.

Prior to 1994, race, gender and class were the dominant factors driving South Africa's political economy and water management. Under this regime, very few black men or women used any significant quantities of water for productive uses, or had a formal water allocation. Water resources were concentrated in the hands of the minority white population.

The new policy was aimed at contributing to building a society in which the ecologically sustainable use of water supported equitable economic growth and social transformation. Thus the White Paper brought in several significant changes in the approach to water resources management:

- Groundwater and surface water were accorded the same legal status, with groundwater no longer seen as an essentially private matter. All water belonged to the people of South Africa, with the Minister acting as custodian;
- Water for basic human needs and for the sustainable ecological functioning of water resources was recognised as a right, under the concept of the Reserve;
- Water for international purposes was accorded the second highest priority, after the Reserve;
- Riparian rights were substituted by time bound allocations (water use entitlements);
- Water resources management was to be performed according to catchment boundaries, by decentralised catchment management agencies;
- Water could be reallocated to address past inequities in access and to meet water quality and ecological requirements; and
- Water should be priced to recover the full financial cost of infrastructure and governance to provide access to water, considering social equity and national strategic imperatives.

Based on the White Paper, the National Water Act (1998) was drafted, consulted on, and passed. The Act, drawn up with considerable international advice, maintains what was good from the pre-

²³ Pegram G and Schreiner B, Financing Water Resource Management, South African Experience, Case Study Report, February 2009

1994 period, such as the operation and development of a massive infrastructure system and government's ongoing regulatory role for large-scale users, while being fundamentally transformative in terms of righting the wrongs of the apartheid era. The objective of the National Water Act is *"managing the quantity, quality and reliability of the nation's water resources is to achieve optimum social and economic benefit for the nation from their use"*.

The National Water Act also requires the development of a National Water Resource Strategy (NWRS), to be reviewed every five years, and the development of a Pricing Strategy for raw water, also to be reviewed every five years. The NWRS sets out the strategies, policy and approaches to implementing the policy and managing the water resources of the country. The first NWRS was published in 2005²⁴ and spelt out a phased programme for the introduction of institutional reforms and new management instruments. It is binding on all government departments and spheres of government.

5.2 Governance

Under the Constitution of South Africa, water resources management is a national competency. The Department of Water Affairs (DWA) is responsible for exercising the custodianship role envisaged in the White Paper, including through the allocation, protection, management and development of water resources. Provincial government has no water resources management function.

Local government does not have any constitutional responsibility for water resources management, but are responsible for provision and management of water supply and sanitation services. They are also responsible for land use planning and development within their area of jurisdiction. While municipalities fall under the oversight of provincial and other national government, DWA is responsible for ensuring the effective delivery of services and the meeting of national norms and standards for water services and sanitation.

The decision taken in 1994 to bring together in one Department the oversight of water resource management and water service (water supply and sanitation) provision helped to provide a coherent perspective on the full cycle of water resource management and water service provision.

²⁴ DWAF, National Water Resource Strategy First Edition (NWRS), Pretoria, 2004

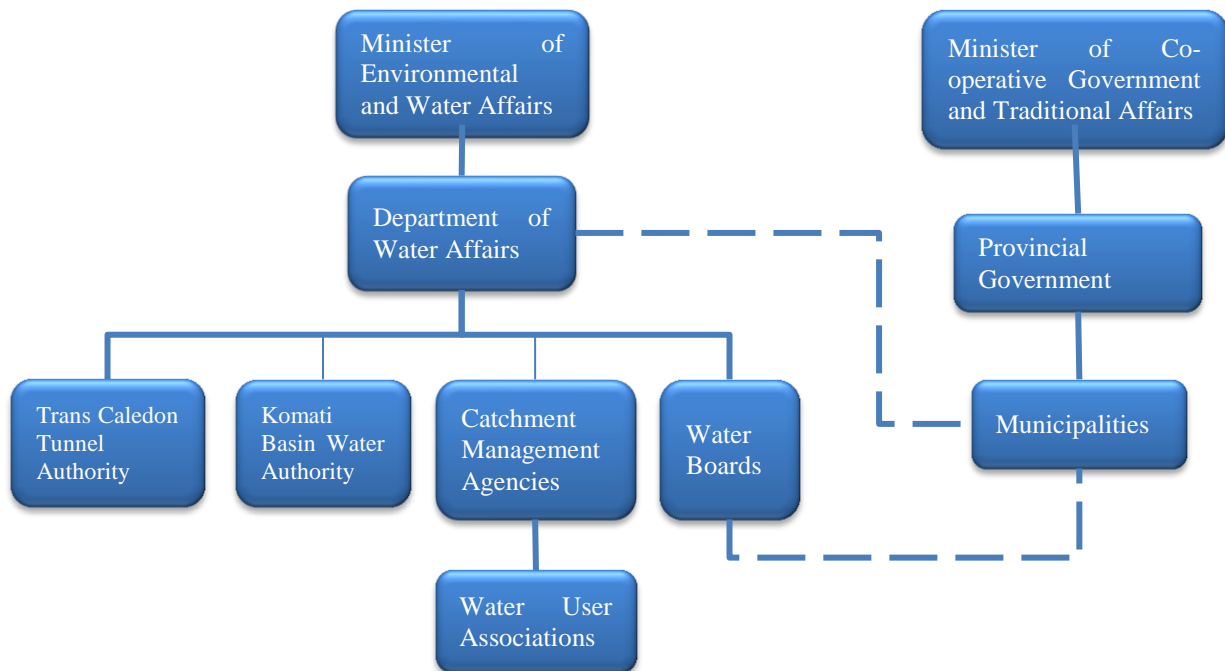


Figure 5-1 Key water management and water services institutions in South Africa

While the NWA enables the establishment of Catchment Management Agencies (CMA) to manage water resources at the basin level, only 2 of an originally envisaged 19 are actually up and running. A further 6 have been established on paper. The CMAs are intended to be responsible for the implementation of water resources management at the basin level. A current review of the establishment of CMAs seems likely to recommend that 9 be established, rather than 19.

Water Boards are responsible for bulk potable water supply to municipalities and bulk users in specific areas in the country. Water user associations and irrigation boards are responsible for the management of local water resources used for common purpose; largely, but not entirely, for agricultural irrigation purposes.

The Trans Caledon Tunnel Authority (TCTA) and the Komati Basin Water Authority are bodies established for the financing and development of trans-boundary infrastructure projects, although the TCTA is also funding various national projects as directed by the Minister of Water Affairs.

5.3 Scale and scope of the water sector

The purpose of this section is to provide an indication of the current scale and scope of the South African water sector, based on existing reports. It is acknowledged that this information may not reflect the true position and so future deliverables will interrogate the data to develop a credible picture upon which to base future policy decisions.

The current state of water and sanitation infrastructure in South Africa as per DWA's Water Sector Investment Framework (WIF) analysis is as below.²⁵

- Overall, government water resources infrastructure, under the control of DWA, is in relatively good condition, but declining
- Smaller scale water resources infrastructure is, overall, in a moderate to poor condition.
- Regional bulk water supply infrastructure primarily serving urban areas in relatively good condition but is aging.
- Smaller scale water supply systems serving towns and rural areas is often not well managed and is, in many cases, in bad condition (blue drop reports). The problem is particularly severe in rural areas where even relatively new systems are in a poor state (CSIR report).
- Wastewater infrastructure, particularly in small to medium sized systems is often in poor condition (Green Drop reports).
- On site sanitation systems provided in mostly rural areas are relatively robust but there is inadequate provision for pit emptying.
- Irrigation distribution infrastructure, some of this owned by DWA, is often in poor condition typically having been built decades ago.

Infrastructure in decline starts to lose its effectiveness. It also leads to an escalation in maintenance requirements, an increasingly negative impact on the environment and most importantly, a poor service to end users of the service associated with the infrastructure.

The department of water affairs undertook an analysis on what it will cost to provide new water and sanitation infrastructure and rehabilitate the infrastructure which exists in South Africa. This includes all infrastructure required to develop water resources, abstract water, treat it where necessary, store it and convey it to taps accessible to households, institutions, enterprises and farms. Also included is the infrastructure required to collect wastewater, treat it and return it safely to the environment. The estimate of capital costs was based on Government policy with respect to social and economic objectives, taking service levels into consideration.

The analysis is contained in a single integrated investment planning model which includes all water uses, all infrastructure and all the financial flows in the sector, regardless of who is responsible for the infrastructure and who finances it.

²⁵ DWA – Water sector investment framework – Phase 2, Structure of analysis and results, Version 3 – 1st May 2012

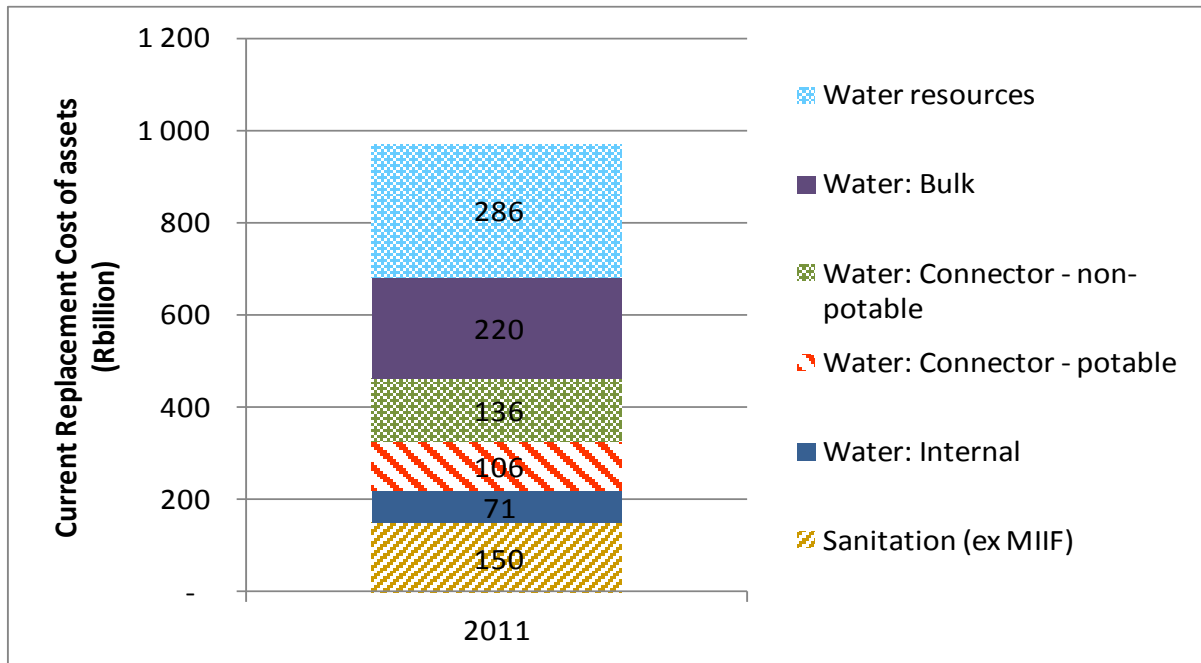


Figure 5-2 Total value of assets²⁶

The results indicate that an amount of R668 billion is required over the coming 10 years and therefore R67 billion per annum. See the figure below indicating the breakdown of the capital required in terms of refurbishments versus new build.

²⁶ DWA – Water sector investment framework – Phase 2, Structure of analysis and results, Version 3 – 1st May 2012

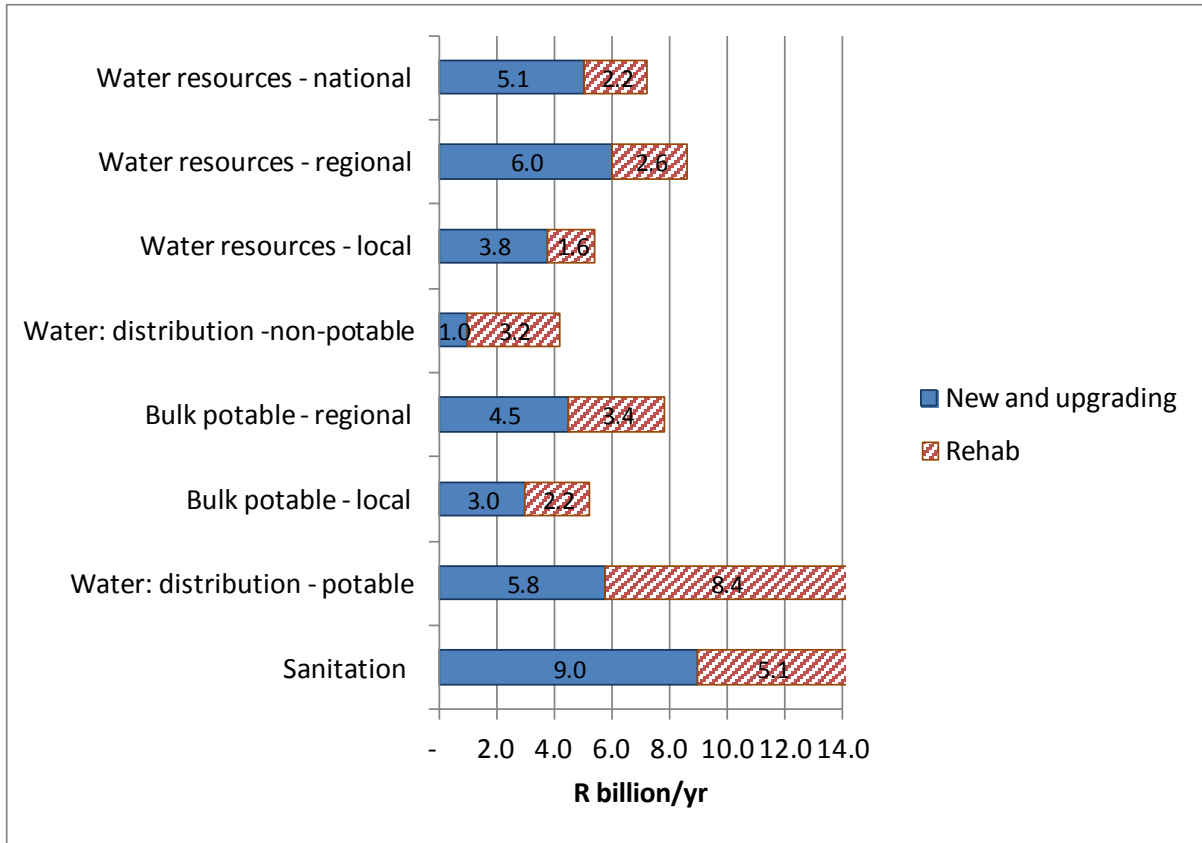


Figure 5-3 Capital required (R67 billion per annum) ²⁷

Operating costs for the whole sector are projected as follows, taking operation, maintenance and finance charges into consideration:

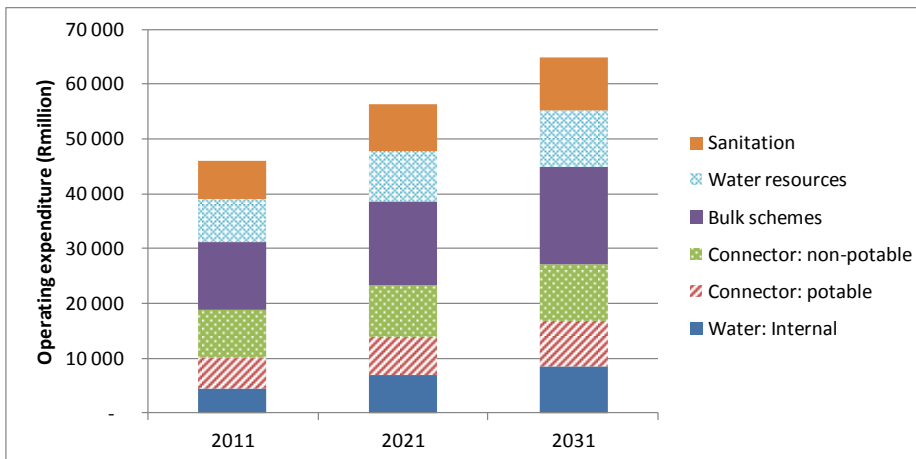


Figure 5-4 Opex required ²⁸

²⁷ ibid

Revenue raised by local government, water boards and the WTE in the 2011/2012 year was approximately R41 billion (WUA data is unknown), noting that there is some double-counting inherent in this, as the R9bn invoiced by Water Boards is primarily charged to local government, as is a portion of the WTE charges for water resources. Even so, the combined revenue is less than the operating expenditure requirement in 2011 of R45 billion.

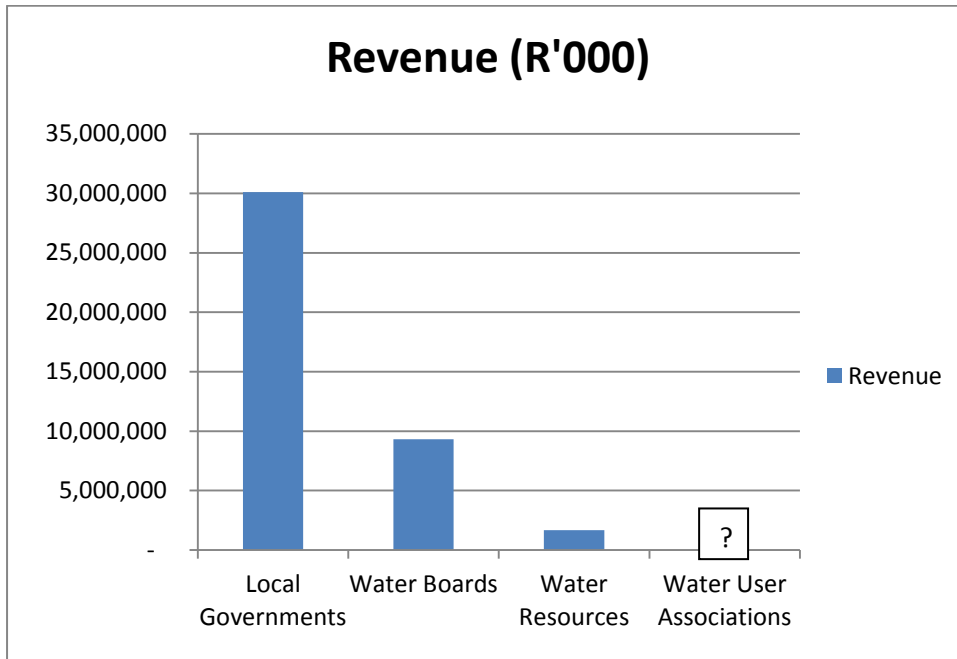


Figure 5-5 Revenue raised

Returning to the analysis of capital requirements, the DWA analysis concluded that under current financial arrangements, about R33 billion a year (R330 billion over the 10 years) is available. See below for the current sources of finance arrangements.

²⁸ DWA – Water sector investment framework – Phase 2, Structure of analysis and results, Version 3 – 1st May 2012

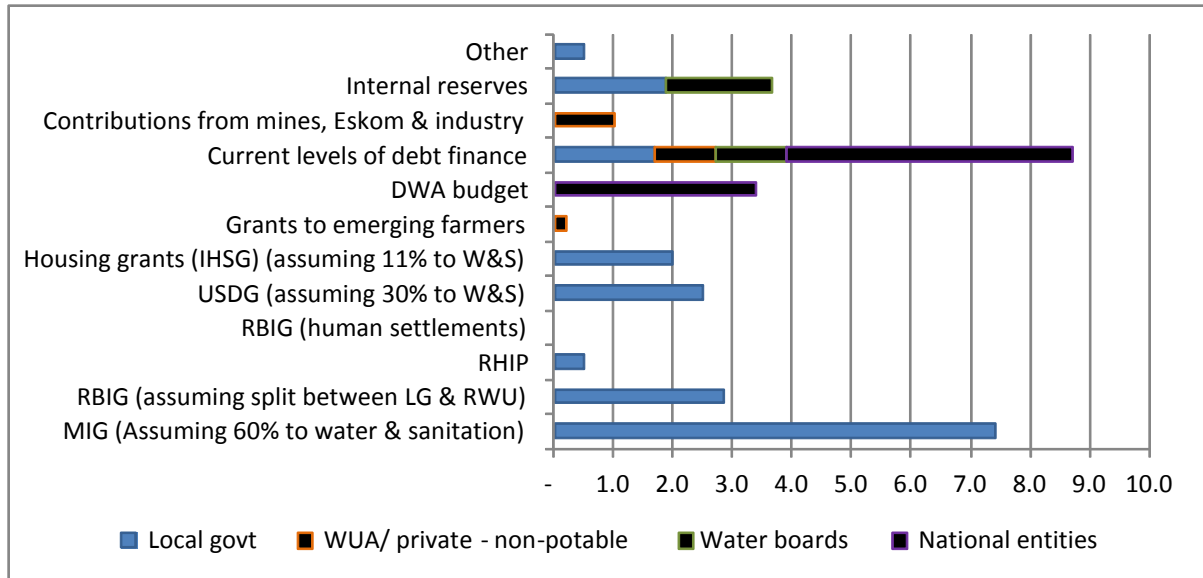


Figure 5-6 Sources of finance (current arrangements-R33 billion per annum)²⁹

This implies that a further R338 billion would be required over the next 10 years (or R34 billion a year). Alternatively, the water sector needs to match the capital funding requirements for new build and refurbishment with the available capital (from the fiscus and private financiers), as well as ensure that the operational expenditure and any debt finance repayments may be covered by revenue and any operational grants. Suffice to say that there is significant water investment required over the next 20 years.

A more thorough analysis is required to determine the refurbishment and new capital investment requirements for water resources infrastructure at the national, regional and local level. This is the focus of a parallel task of the project, and until these results are obtained, no further conclusions will be made about the magnitude and timing of the water resources funding requirements.

5.4 Sources of funds for O&M and refurbishment

The Pricing strategy provides for three separate elements to the raw water charge: a component to cover operations and maintenance, a component to cover depreciation – which is meant to cover the future refurbishment of the asset, and a component called ‘Return on Assets’ which is meant to pay for future betterment (augmentation) of the basin infrastructure.

In practice, due to under-recovery of charges – mainly due to poor collection – the ‘Return on Asset’ component as well as the Depreciation component have been used to fund operations and maintenance.

5.5 Current sources of funds for infrastructure development

A distinction needs to be made between infrastructure to meet social demand versus infrastructure for commercial demand. Typically the former is funded on-budget from the fiscus with charges

²⁹ ibid

being set to recover operational and nominal asset costs, while the latter is financed using commercial off-budget finance with charges being set to recover the full financial cost of operation and debt repayment. There are cases where infrastructure is developed on-budget to promote economic development, but with charges to commercial users negotiated at the full financial cost (equivalent to off-budget financing).

The classification of a project (or water use) as social or commercial is at the sole discretion of the Minister, but there is no clear definition of what constitutes social use. In general, social use is seen to be water for disadvantaged communities that cannot afford to pay the costs of the infrastructure. The National Water Act, which gives legislative form to the White Paper and government's focus, has shifted to meeting the social needs of the rural poor.

5.5.1 Funding through capital grants (on-budget)

Water resource infrastructure owned and operated by the Department has predominantly been funded by the State through fiscal transfers i.e. by State equity and not by debt.

5.5.2 Funding through user charges (off budget)

South Africa has traditionally applied user charges to finance economic infrastructure through a special purpose vehicle, the Trans-Caledon Tunnel Authority (TCTA). The first project financed by the TCTA was backed by an explicit government guarantee on the debt, whilst subsequent projects have relied on implicit government guarantees on the cash flows relating to user charges. All TCTA's debt therefore appears on the State's national balance sheet as a contingent liability.

Before capital can be raised off-budget, off-take agreements must be signed with DWA by the commercial recipients of the water guaranteeing to purchase a specified amount of water at the set price for the duration of the project debt repayment. In turn, DWA signs an income agreement with the TCTA, which provides an implicit guarantee for the agreed charges and reduces TCTA risk. The Capital Unit Charge (CUC) is then billed and collected from users by DWA as a line item on the infrastructure invoice and transferred to the TCTA, together with an O&M charge on off-budget infrastructure. It is intended that a water resource development charge will be set by the Minister (which in principle will be less than the ROA) once the project debt has been paid off, and that this will be applied with a depreciation charge.

5.5.3 Official Development Assistance (ODA) (off budget)

Donations make up a very small percentage of funds utilised in the water resources sector. A major concern with donations is that a well-intentioned donation may create responsibilities, obligations or other consequences that the recipient had not considered. For example, the donation of an asset may give rise to operating and maintenance costs that are not sustainable. In order to prevent these scenarios, National Treasury formed an International Development Co-operation (IDC) directorate which was responsible for the establishment of a policy framework and management system for Official Development Assistance (ODA).

ODA is regarded by 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 as actual non-repayable funds, technical cooperation in the form of expertise and financial co-operation as loans or credit guarantees. The Department of Water Affairs receives a direct funding

through its Directorate for International Relations. The bulk of ODA received by DWA are grants from the European Commission, Ireland, Belgium (Flanders) and DFID.

The ODA listing, run for all donations to the Water and Sanitation sector, covering a period ranging from 1996 (and stretching into the future to as far as 2026 for some of the loans), reveals total committed funds of R5.8bn (with expected matched funds of R2.6bn). The vast majority of these funds are directed towards water services and sanitation services.

Some finance has been provided by donors for seed funding of demand management through South African development institutions, such as the DBSA. There are opportunities for endowment funding or guarantees for funds that support small local infrastructure investments to meet social investments. There is also an emerging global debate to fund green infrastructure projects – or to provide grants to supplement the cost of green infrastructure, where it would otherwise not be economically viable. A number of international funds have been set up, and this may become a reliable source of funds for raw water development in the future.

5.6 Business Models (financing mechanisms)

Since 1994, the development of water resources infrastructure (particularly the large schemes) has predominantly been funded off-budget and costs recouped from water users. This was mainly done through TCTA. The various institutions and mechanisms used for current financing of water infrastructure are described in detail in Appendix A, and summarised below.

5.6.1 Infrastructure Branch

Infrastructure development that is funded on-budget is implemented through the Infrastructure Branch of the Department. Some or all of the costs are expected to be recovered through the Infrastructure charge as determined by the Pricing Strategy. It is scheme based and consists of three elements:

- Operations and Maintenance
- Depreciation
- Return on Assets

The first element is based on the actual cost of operating and maintaining the particular scheme. The second two elements are based on the asset replacement value (or cost) of the scheme, with the ROA being a fixed 4%. The depreciation charge is meant to fund the rehabilitation of assets to their original value, while the ROA is meant to fund the betterment of existing assets, as well as the development of new social waterworks.

5.6.2 TCTA

The Trans-Caledon Tunnel Authority (TCTA) is a state owned entity, mandated to implement and finance raw bulk water infrastructure, and is empowered to raise finance from the domestic and international money markets. TCTA has a few projects as per explicit directives from the Minister of Water and Environmental Affairs. The enterprise raises finance for the projects as well as manages the design and construction of the infrastructure. Some of the projects that TCTA finances and implements include

- Lesotho Highlands Water Project (LHWP) – South Africa portion of the Delivery Tunnel North

- Berg Water Project (BWP)
- Vaal River Eastern Subsystem Augmentation Project (VRESAP)
- Mooi-Mgeni Transfer Scheme Phase 2 (MMTS2)
- Komati Water Scheme Augmentation Project (KWSAP)
- Olifants River Water Resource Development Project Phase 2 (ORWRDP2)
- Mokolo-Crocodile River Water Augmentation Project (MCWAP)

The TCTA's business model is commercially driven. Charges are set at a rate that will repay the debt while ensuring long-term stability of charges. As debt is repaid, new projects can be undertaken – ideally at charges which are in line with the historic charges for earlier projects. An important element of the model is the requirement to have off-take agreements in place before a project can commence. Extensive negotiation with future users is therefore required.

TCTA mostly raises financing via issuing nominal debt in the South African capital market, obtaining long-term loans from local banks as well as loans from local and international development financial institutions. Foreign financing does not play a major role in the TCTA and constitutes less than 3% of the entire financing for projects. In the local market, short- to medium-term financing in the domestic market is accessed through a commercial paper programme and other local loans. The financing is off-budget, relies on the implicit guarantees from Treasury and all projects are ring-fenced.

5.6.3 Water User Associations (WUAs)

A WUA derives its mandate from the National Water Act and is also considered a water management body and subsequently has the authority and responsibilities of such an institution (Thompson, 2006:655). A WUA will ultimately be under the control of a catchment management agency (CMA) in whose area of authority it functions but in the absence of a CMA or its inability to manage the WUA, the Minister takes control of the WUA (Thompson, 2006: 648).

Irrigation Boards and Water User Associations are entitled to set charges/levies on their Members to recover the costs of administration, operation, depreciation and debt repayment of their own schemes, following the requirements of their constitutions. Where they are responsible for the operation of government water schemes, they can act as billing and/or implementing agents for DWA. There have been difficulties in repayment of all of these debts by farmers over the past decade, which has restricted the willingness of banks to provide loans. Current government policy is that the state will no longer underwrite either private sector or Land Bank loans.

5.6.4 Water Boards

Water boards are state entities created by the Minister of Water Affairs in terms of Chapter VI of the Water Services Act. A water board is a body corporate, and thus the financial business model is commercial in nature. A water board must strive to be financially independent and to this purpose must negotiate and set tariffs that ensure the financial sustainability of the water board.

National Treasury has established guidelines limiting the borrowing powers of water boards and as a requirement, water boards must obtain National Treasury permission if they wish to exceed their borrowing limits. Debt collection is a major concern for most water boards. At a meeting of

Parliament's portfolio committee³⁰ on Water Affairs and Forestry, SALGA noted that this was due to several factors, namely that,

- several municipal billing systems were ineffective and outdated,
- in some cases there was no contract in place between water board and water service institution, and
- the accrual of interest on outstanding amounts.

5.6.5 Local government

The financial business model of a water service authority is closely regulated by the Municipal Finance Management Act, 2003 (MFMA).

While no breakdown is provided for water, in 2009/10, the municipalities sourced their capex as follows: Government grants and subsidies: R19.5bn (48%), external loans: R9bn (22%), public contributions and donations: R300m (0.7%) and R12bn (30%) from internally generated funds.³¹ The high contribution from internally generated funds was expected to decline over the following 3 years, to a level of only 17%, with national transfers expected to make up the difference (by increasing to 58%). The Review indicates an increased reliance on national government transfers to fund local government's infrastructure investment.

Whilst borrowing has increased over the past 5 years, this has been driven by the public sector (almost exclusively the Development Bank of Southern Africa (DBSA)). The National Treasury review indicates that private lenders became more risk averse after the recession in 2008, and a major private lender to municipalities, namely the Infrastructure Finance Corporation (INCA), withdrew from the market in 2009 (citing declining margins due to competition from public sector lenders).

³⁰ Parliamentary Monitoring Group. Water Boards' Annual Reports 2006/2007. Available: www.pmg.org.za. Accessed: March 2009

³¹ National Treasury's Local Government Revenue and Expenditure Review, 2011

6 The Development of Principles

The chapters above have provided the context and challenge of infrastructure financing in South Africa over the next two decades. Chapters 4 and 5 have summarised the international and local financing mechanisms – either in use or under consideration. The purpose of this chapter is to use the above input, together with the conceptual model developed in chapter 2, to raise and confirm the principles that need to underpin the identification and selection of suitable financing mechanisms.

6.1 The origin of principles

Principles that govern the financing of infrastructure need to be embedded in a broader framework that takes into account the constitutional and developmental imperatives that shape our policy and legislative environment. These high level imperatives and context then determine the operational principles relating to water infrastructure finance. This is illustrated in

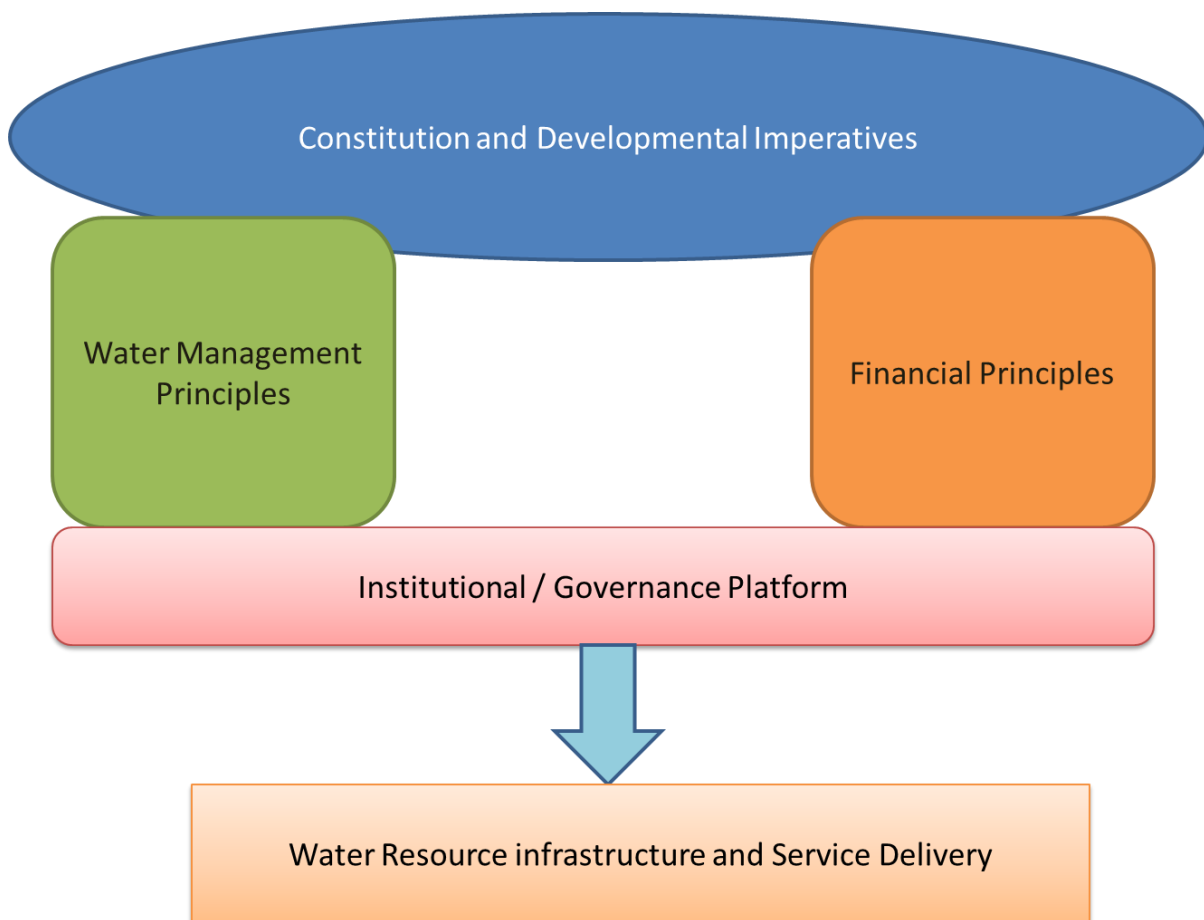


Figure 6-1 Framework for Principles

6.2 Constitutional and developmental imperatives

Based on the preceding chapters and a broader understanding of the Constitution, public finance principles, and the principles that underpin the National Water Act and Water Services Act, the following principles can be put forward.

To start with it is critical to recognise that South African government imperatives obtain their guidance from the following constitutional rights and principles articulated through policy and legislation:

- Right of access to sufficient water
- Right to an environment not harmful to health or well-being
- Socially and environmentally justifiable economic development
- Equity in access to resources and opportunity
- Redress of historical discrimination on race and gender

6.3 Water management imperatives

The principles central to water management imperatives are those related to allocation and use of water. The National Water Act and Water Services Act reaffirm the Constitutional right that we all have to a basic water supply and basic sanitation. The Acts also recognise that these basic rights need to be addressed within the context of: historical inequity, financial sustainability and ecological sustainability. The principles stemming from water management imperatives can therefore be categorised as follows (insofar as they relate to infrastructure development):

6.3.1 Social equity

- Everyone has a right to basic water and sanitation
- The inequities of the past need to be addressed

6.3.2 Economic growth

- Access to water provides the poor with not only a means to live, but a means to develop themselves. A principle deriving from this understanding is to ensure that the poor are given access to more than just their basic needs in the interest of economic development. This is especially relevant for the rural poor who have the potential to develop agricultural enterprises.

6.3.3 Ecological/resource sustainability

- The water needs for the effective functioning of aquatic ecosystems must be protected
- Build climate resilience and adaptation

6.4 Fiscal Policy

Juxtaposed with the principals that underpin the conceptual model as described in Chapter 2 (related to water management) are the principles that derive from fiscal policy. Government's fiscal policy seeks to support structural reforms of the South African economy consistent with long-run growth, employment creation and an equitable distribution of income.³²

Two primary concerns for fiscal policy are operational and allocative efficiency. These key efficiency concerns are the pre-cursor to any assessment of budget submissions.

Fiscal policy is also concerned with financial viability, and who pays.

³² http://www.info.gov.za/aboutsa/finance.htm#fiscal_policy

6.4.1 Operational efficiency

Linked to the infrastructure principles outlined below, a key fiscal concern is whether the proposed solution is operationally efficient. Failure to demonstrate efficiency will result in projects not receiving support from the Treasury.

6.4.2 Allocative efficiency

The concept of efficiency in allocation refers to the best use of a limited resource. It can be applied at a national level – regarding the best use of the State’s resources – and to a local level, such as the best use of the finance and skills available to a local water scheme. Projects should demonstrate that they represent the best use of resources at that particular time, or in that particular context. Of particular relevance to allocative efficiency is the concept of regional economic development and the focus on rural development nodes. What this means is that there may be circumstances where it is appropriate to allocate funds to a particular project, in the interests of regional economic development, even where that region is not currently able to fully utilise that infrastructure or pay for it.

6.4.3 User pays

The “User Pays” principle is a fundamental fiscal principle that guides the decision making of the Treasury. Beneficiaries of the water management system should contribute to the cost of its establishment and maintenance on an equitable basis. Linked to this is the globally accepted principle of “Polluter Pays” (codified in the National Environmental Management Act).

The principle does, however, have to be tempered by the recognition that water is a public good and therefore limits on affordability – especially in the context of redress and access – have to be accommodated. If a user cannot afford to pay, then the only alternatives are fiscal support or cross-subsidisation. These options are considered further below, in the operationalization of principles.

6.4.4 Financial viability

The building of infrastructure requires up-front capital investment. Where the costs of this infrastructure are to be recovered from users (or tax payers) over time, then a financing mechanism (such as debt) is required to match the cash-flows. The matching of inflows to outflows over the life of the financial commitment creates risks such as credit risk (bad debts), exchange rate risk and interest rate risk. Financial viability, supported by a demonstration of operational efficiency and appropriate support from users, must take sufficient cognisance of these risks.

Linked to financial viability is the understanding of full cost recovery. The cost of managing the Reserve, for example, must be paid for by all registered and billable users in terms of Section 56(2) (a) (iv) of the NWA. Financial sustainability also requires that the full financial cost of water resource management and supplying water should be recovered from water users, including the cost of capital, the cost of operations and the cost of maintenance.

6.5 Infrastructure principles

The high level principles above dictate the demand for water and the supply of capital to finance it. Infrastructure is what is required to manage the resource, and it too is subject to principles that may impact on the financing mechanisms. Infrastructure principles include:

- Reliability (assurance)

- Fitness for use (quality)
- System efficiency (technical)
- Asset maintenance – assets should not be constructed without a full life-cycle asset management and maintenance plan
- Public safety
- Robustness (resilience)
- Backward integration

The key consequences for financing principles are the importance of ensuring sustainability not just in capex terms, but also in respect of on-going operations and maintenance, and the importance of appropriate technical design – e.g. assets should not be over-specified.

6.6 Principles of Governance and institutions

The water management imperatives, and the infrastructure that is required to enable them, converge with fiscal policy, and its influence on financing. This convergence takes place in the institutions that are required to manage the infrastructure and/or the financing thereof.

The principles that affect the financing of infrastructure are proposed as follows:

- Good governance: External investment is attracted to stable environments. Accountable institutions with a clear mandate are therefore more likely to attract finance.
- Private sector participation: The participation of private sector institutions is to be encouraged if it increases access to finance and capacity, with the caveat that this participation should be within a managed environment to address concerns relating to market failure – especially as related to social and environmental needs.
- Risk should be borne by the institution arranging the finance, but with the caveat that government guarantees may be required to support institutions that do not yet have the track record, or where the risk is best borne by national government, e.g., due to the social nature of the investment.
- Institutions should be sustainable – at least for as long as the projects that they support.
- Institutions should be efficient. The creation of multiple institutions (with their related overhead costs) should be considered against the alternative of shared costs and economies of scale.

In the same way that infrastructure projects should only be implemented if financially sustainable, institutions should only be established if they are sustainable and efficient.

6.7 Putting principles into practice

It is useful to consider Operating Principles under the following categories:

6.7.1 Strategic purpose

All projects need to be aligned with the strategic purpose of the country and of the water sector. The key principles of operational and allocative efficiency should be clearly demonstrated, given the limited fiscal support available.

6.7.2 Economic versus social benefit

A cost-benefit analysis needs to be undertaken for all projects, highlighting the trade-offs that will be required – especially as relate to the utilisation of scarce resources and the prioritisation of the proposed activities over others.

The cost-benefit is not restricted to the project, but needs to be considered within the context of the value chain, as well as within the context of the economic development of that region. This is particularly relevant to government's focus on the development of rural nodes, where the benefit of water infrastructure may extend beyond the direct returns from charges.

6.7.3 User Pays

The user pay principle, combined with the need for social equity and redress, means that the full costs of infrastructure (including its operation and maintenance) must be recovered from users. In cases where affordability is a constraint due to poverty of the recipients, then there are only two alternatives: either the state (or a donor) needs to fund the project, or other users need to cross-subsidise.

It is proposed that where the proposed intervention is in the public interest (such as environmental conservation) or where the users are constrained by poverty but are nevertheless entitled to benefit (due to water being a constitutional right), then the state should pay.

The National Water Act (No 36 of 1998), provides for the differentiation of water use charges based on socio-economic status. However it also stipulates (in section 57(5)) that '*no charge made under this Act may be of such a nature as to constitute the imposition of a tax, levy or duty.*' It may be argued that cross-subsidisation is at risk of representing a levy or tax for those that are charged more than what they beneficially receive. This implies that where a lower charge is levied on poor users, the unrecovered cost should be covered by the state.

6.7.4 Financial sustainability

Infrastructure needs to be financially sustainable – this applies both to the capital cost as well as subsequent operation and maintenance over the life cycle of the asset. The underlying financing mechanisms need to support this principle of sustainability by allowing for the matching of inflows and outflows over the lifespan of the infrastructure.

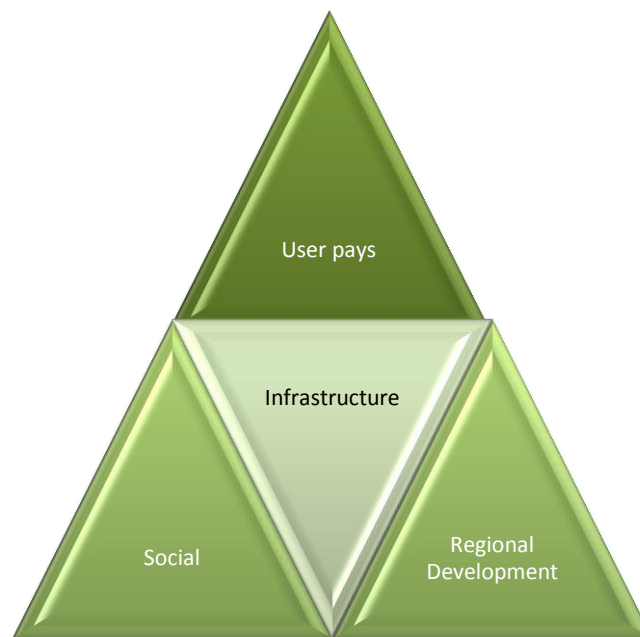
Financial sustainability begins at a project level – where the project must either be economically sustainable, or supported by grants to make the social components viable. It then extends to viability down the whole value chain – since it is ultimately the end users that are expected to pay for the water resource infrastructure. Finally, it points to financial integration across the whole sector, to avoid unforeseen cross-subsidisation or unsustainable cost duplication.

6.8 Summary

To summarise, principles for infrastructure finance are embedded in a broader constitutional, social and fiscal mandate. These result in three key drivers that may trade off against each other in the financing of any infrastructure projects, and the financial and institutional models that support them:

- i. User pays
- ii. Social infrastructure requiring external (usually fiscal) support
- iii. Regional economic development requiring a catalyst (usually fiscal).

This trade-off is illustrated below.



Bearing these drivers in mind, each financing mechanism must demonstrate the following:

1. Aligned with strategic purpose and operationally efficient.
2. Cost-Benefit analysis demonstrates allocative efficiency – including consideration of rural and regional economic development.
3. Starts from basis that the user pays, but State support considered where affordability inhibits the ability to achieve equity and redress.
4. Sustainability – the matching of all cash flows (both capital and operating) over the life of the project, assets and institutions.

7 Appendix A – South African financing institutions

7.1 SA Water sector financing institutions

The various institutions and mechanisms used for current financing of water infrastructure are described below.

7.1.1 Infrastructure Branch

Infrastructure that is funded on-budget is implemented through the Infrastructure Branch of the Department. Some or all of the costs are expected to be recovered through the Infrastructure charge as determined by the Pricing Strategy. It is scheme based and consists of three elements:

- Operations and Maintenance
- Depreciation
- Return on Assets

The first element is based on the actual cost of operating and maintaining the particular scheme. The second two elements are based on the asset replacement value (or cost) of the scheme, with the ROA being a fixed 4%. The depreciation charge is meant to fund the rehabilitation of assets to their original value, while the ROA is meant to fund the betterment of existing assets, as well as the development of new social waterworks.

7.1.2 TCTA

The Trans-Caledon Tunnel Authority (TCTA) is mandated to implement and fund raw bulk water infrastructure and is empowered to raise funds from the domestic and international money markets. Over the past 20 years, about R21 billion of investment in the Lesotho Highlands, Berg River Dam, and the Vaal River Augmentation projects was funded from commercial sources (predominantly the bond market) through TCTA.

7.1.2.1 Mandate

TCTA is a state-owned entity, established in terms of Government Notice No 2631 in Government Gazette No 10545, dated 12 December 1986. The notice was replaced by Government Notice 277 in Government Gazette No 21017 dated 24 March 2000, promulgated in terms of the National Water Act, 1988 (Chapter 10).

TCTA is a specialised liability management body. Its mission is primarily to finance and implement bulk raw water infrastructure:

- within an acceptable risk framework;
- in the most cost-effective manner; and
- in order to benefit water consumers.

Its original mandate was to give effect to the Treaty on the Lesotho Highlands Water Project between the Government of South Africa and the Government of Lesotho and to operate the associated infrastructure. Subsequent mandates are given by the Minister on a project by project basis.

7.1.2.2 Governance

TCTA operates within the regulatory framework of the National Water Act, 1998 (Act 36 of 1998) and is a Schedule 2 Public Entity in terms of the provisions of the Public Finance Management Act, 1999 (Act 1 of 1999). TCTA has a Board of Directors that is appointed by the Minister of Water Affairs.

7.1.2.3 Nature of infrastructure being funded

TCTA's mandate is generally to develop infrastructure that has a high degree of economic utilisation, the expectation being that TCTA will be able to recover the full cost of the infrastructure without having to resort to government grants or transfers. Some of the more recent projects, such as Olifants, do have an element of social use, and this may have an impact on TCTA's financing model going forward. TCTA works closely with the DWA, the water boards, municipalities and other entities linked to bulk raw water infrastructure. TCTA has a few projects as per explicit directives from the Minister of Water and Environmental Affairs. TCTA raises the finance for the projects as well as manages the design and construction of the infrastructure.

The projects which TCTA funds and implements are:

- Lesotho Highlands Water Project (LHWP) – South Africa portion of the Delivery Tunnel North

The total project cost is R 16.4 billion and is fully subsidised by the payments from water users via water sales from the Vaal River System. The financing is explicitly government guaranteed. The South African Government is responsible for the full water costs incurred by TCTA and the Lesotho Highlands Development Authority.

- Berg Water Project (BWP)

This project was funded off balance sheet. A long term loan was received from ABSA Bank, Development Bank of South Africa and the European Investment Bank. Repayment of the loans will be made from the revenue generated from the sale of water to the City of Cape Town.

- Vaal River Eastern Subsystem Augmentation Project (VRESAP)

This project was financed off government budget without an explicit government guarantee. The revenue generated from the sale of water to Eskom, Sasol and the Vaal River Eastern Subsystem users will cover the repayments.

- Mooi-Mgeni Transfer Scheme Phase 2 (MMTS2)

The project is funded off budget and the costs recovered from the revenue generated from the sale of water.

- Komati Water Scheme Augmentation Project (KWSAP)

This project is funded off budget and the capital costs will be recovered from the revenue generated from the sale of water to Eskom over a 20-year period after commissioning.

- Olifants River Water Resource Development Project Phase 2 (ORWRDP2)

Mining activities and municipalities are the two main user groups. The municipalities, through National Treasury, will finance approximately 50% of the project and the balance through other off budget mechanisms. The capital costs will be recovered from the revenue generated from the sale of water to industrial users.

- Mokolo-Crocodile River Water Augmentation Project (MCWAP)

This project will largely be financed off budget and repaid from revenues from sale of water delivered to offtakers.

7.1.2.4 Business Model (Sources of funds and financing methods)

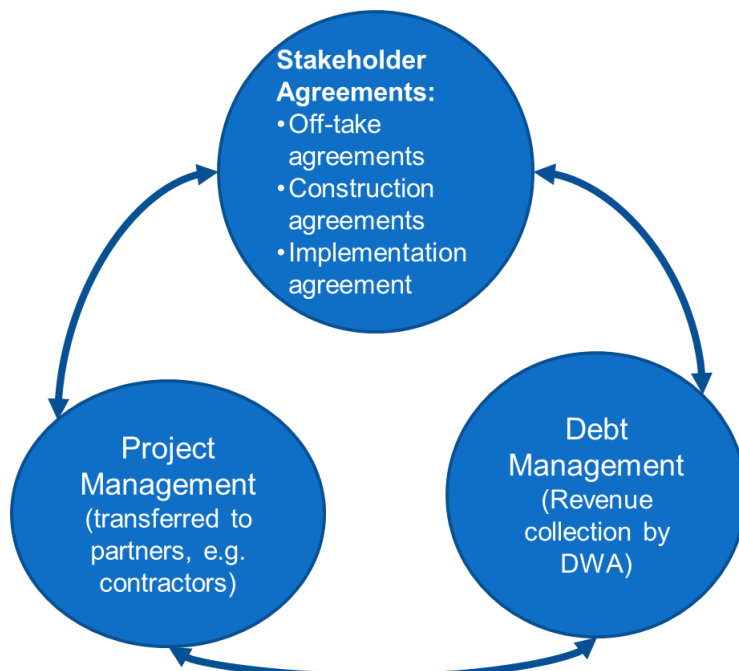
The TCTA's business model is commercially driven. Charges are set at a rate that will repay the debt while ensuring long-term stability of charges. As debt is repaid, new projects can be undertaken – ideally at charges which are in line with the historic charges for earlier projects. In the Vaal system, charges are not scheme based, but system based, while other infrastructure tends to have charges that are scheme based.

An important element of the model is the requirement to have off-take agreements in place before a project can commence. Extensive negotiation with future users is therefore required.

7.1.2.5 Key characteristics of the TCTA financing model

- Financing is off-Balance Sheet,
- Financing relies only on implicit guarantees from Treasury (excluding Lesotho Highlands (LHWP), which is explicitly guaranteed)
- All projects are ring-fenced, i.e. no cross-subsidisation is allowed
- Debt repayment is funded through water tariffs, over 20 years
- Deficit is intended to ensure on-going affordability for end users; the deficit reverses after a few years, and is not related to TCTA's feasibility as a going concern.

7.1.2.6 Risk model



T C T A								
Liability management for bulk raw water infrastructure development								
Implementation & Funding Mandates							Advisory	
	LHWP	BWP	VRESAP	MMTS2	ORWRDP2	KWSAP	MCWAP 1	DWAF
Revenue Recourse	Explicit Government Guaranteed	• Income stream of BWP • Implied guarantee	• Income stream of VRESAP • Implied guarantee	• Income stream of MMTS2 • Implied guarantee	• Income stream of ORWRDP2 • Implied guarantee	• Income stream of KWSAP • Implied guarantee	• Income stream of MCWAP • Implied guarantee	Cost recovery from DWAF
Mandate Activities	• Fund • Risk mngmnt • O&M of assets	• Implement • Fund • Risk mngmnt	• Implement • Fund • Risk mngmnt	• Implement • Fund • Risk mngmnt	• Implement • Fund • Risk mngmnt	• Implement • Fund • Risk mngmnt	• Implement • Fund • Risk mngmnt	Expected: -VRESAP-2 - LHWP-2 (approximately R7.5 billion) MCWAP-2 (approximately R11 bn)
Peak of debt	R 20 billion	R 1,4 billion	R 3,3 billion	± R 2 billion	± R 10 billion (Dam & BDS)	± R 2 billion	Construction cost ± R 2 billion	
Construction info: Commenced Completed	1986 2001	2003 2008	2005 2011	2011 2014	Dam: '07 – '12 BDS: '11 – '16	2011 2014	2011 2014	
Repayment of debt	2025	2028	2028	20 years after construction	20 years after construction	20 years after construction	20 years after construction	

TCTA mostly raises financing via issuing nominal debt in the South African capital market, obtaining long-term loans from local banks as well as loans from local and international development financial institutions. Foreign financing does not play a major role in the TCTA and constitutes less than 3% of the entire financing for projects. In the local market, Short- to medium-term financing in the domestic market is accessed through a commercial paper programme and other local loans. As at 31 March 2010, TCTA had issued a total of R1 736 million against an authorised explicit guaranteed amount of R4 billion for the LHWP and a total of R178 million and R58 million from implicit guaranteed amounts of R450 million and R300 million for BWP and VRESAP respectively.

7.1.3 NWRIA

In 2005 an evaluation was made about the possible institutional arrangements for infrastructure management in South Africa³³. This led to Cabinet agreeing to establish the National Water Resource Infrastructure Agency (NWRIA) as an amalgamation between TCTA and the DWAF 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 the raising of general (non-project related) debt against the (primarily ROA) income stream associated with the existing water resources infrastructure assets. This would enable the institution to overcome the short-term constraints associated with requiring project based off-take agreements before off-budget financing could be raised for commercially driven infrastructure. Notwithstanding the Cabinet approval, the formation of the Agency has been put on hold.

³³ DWAF, Institutional Options for Water Resources Management in South Africa, Pretoria, 2005

7.1.4 Water User Associations (WUAs)

7.1.4.1 Mandate

A WUA derives its mandate from the National Water Act, which describes a WUA as a “co-operative associations of individual water users” who for the purpose of common gain, carry out water-related functions. Only the Minister of Water Affairs, in accordance with the prescriptions of the Act, can establish or disestablish such an association.

7.1.4.2 Governance

WUA's are preferably managed by their members to whom they are also accountable. Their management powers and functions are limited to those allocated to them by the Minister. Each WUA is also required to have a constitution which must also be in line with the prescriptions of the Act. This constitution describes the roles, functions and responsibilities of the water user association. A WUA is also considered a water management body and subsequently has the authority and responsibilities of such an institution (Thompson, 2006:655). A WUA will ultimately be under the control of a catchment management agency (CMA) in whose area of authority it functions but in the absence of a CMA or its inability to manage the WUA, the Minister takes control of the WUA (Thompson, 2006: 648).

7.1.4.3 Business Model (Sources of funds and financing mechanisms)

Irrigation Boards and Water User Associations are entitled to set charges/levies on their Members to recover the costs of administration, operation, depreciation and debt repayment of their own schemes, following the requirements of their constitutions. Where they are responsible for the operation of government water schemes, they can act as billing and/or implementing agents for DWA. Some irrigation boards/water user associations have outstanding pre-1994 loans with the Land Bank, while some have taken commercial loans for infrastructure development. There have been difficulties in repayment of all of these debts by farmers over the past decade, which has restricted the willingness of banks to provide loans. Current government policy is that the state will no longer underwrite either private sector or Land Bank loans.

7.1.5 Water Boards

7.1.5.1 Mandate

Water boards are state entities created by the Minister of Water Affairs in terms of Chapter VI of the Water Services Act. The Minister determines the service area of the water board.

“The primary activity of a water board is to provide water services to other water services institutions within its service area” (section 29). In practical terms “activity” has traditionally meant the provision of bulk potable water services to local authorities that depend on a common source of raw water. More recent interpretations suggest that “water services” could include sanitation.

The 15 water boards vary greatly in size and in technical and financial capacity. Rand Water is as large as all the other water boards put together.

7.1.5.2 Governance

Water boards are listed as national government business enterprises in Part B of Schedule 3 of the Public Finance Management Act with which they must comply and, in terms of which they are subject to financial supervision by the National Treasury. The Minister of Water Affairs appoints a

Board subject to criteria provided in the Water Services Act and after a consultation process. The Minister may terminate the services of a board member. Board members have fiduciary responsibility.

A water board must prepare and adopt a policy statement containing prescribed information concerning the water board and all other companies, institutions or bodies in which it has an interest. The policy statement outlines the nature of the Board's business and the operational policies it has adopted. The board must give effect to its policy statement. The policy statement must be accessible to all local authorities in the service area and to the public. The Minister may direct the Board to amend its policy statement.

In addition the Board must adopt a business plan. This is not a public document but it must be made available to the Minister who can direct that it should be amended in certain circumstances.

7.1.5.3 Financial Business Model

A water board is a body corporate, and has the powers of a natural person of full capacity, except those powers which by nature can only attach to natural persons and which are inconsistent with the Act. The financial business model is thus commercial in nature.

A water board must strive to be financially independent and to this purpose must negotiate and set tariffs that ensure the financial sustainability of the water board.

A few water boards make use of DWAF subsidies, with Sedibeng and Botshelo Water receive the largest proportion. Botshelo Water which receives almost 73% of total subsidies disbursed by DWA provides water services to schemes in areas of the North West province which were previously under the homeland of Bophuthatswana. Cost recovery on most of these schemes is low hence the water board's heavy reliance on DWA subsidies.

With regards to borrowing, in 2002, National Treasury established guidelines limiting the borrowing powers of water boards and as a requirement, water boards must obtain National Treasury permission if they wish to exceed their borrowing limits. The aggregated debt: equity ratio of water boards was over 175% in 2004, and has declined each year to be sitting at 50% in 2011. This is attributable to Rand Water and Umgeni Water reducing their debt levels almost every year for the past 7 years. Aggregate long-term debt has decreased from R7bn to R3bn between 2004 and 2011, while equity levels have almost tripled over the same period (from R4.6bn to R13bn).

Debt collection is a major concern for most water boards. In 2011, it was estimated as shown in the table below, that 12 water boards were owed a total of R2.1 billion by municipalities.

WATER BOARDS MUNICIPAL DEBT SUMMARY - DECEMBER 2011							
Name of water board	OUTSTANDING BALANCE	CURRENT	DAYS 30	DAYS 60	DAYS 90	DAYS 120+	ARREARS
Amatola	15 868 304	1 900 197	12 411 440	587 564	1 197 102	(227 999)	13 968 107
Bloem Water	75 661 153	30 600 632	833 292	2 539 039	931 473	40 756 717	45 060 521
Botshelo Water	81 110 478	6 963 829	6 279 376	6 415 398	6 219 322	55 232 553	74 146 649
Bushbuckridge Water	255 335 447	10 737 237	(616 854)	4 030 518	6 853 082	234 331 464	244 598 210
Lepelle Northern Water	325 970 848	23 832 380	10 326 887	10 967 457	9 385 469	271 458 655	302 138 468
Magalies Water	20 777 127	8 657 220	3 447 601	3 396 661	2 696 185	2 579 461	12 119 908
Mhlathuze Water	7 592 444	7 661 213	(69 073)	-	81	223	(68 769)
Overberg Water	945 490	945 490	-	-	-	-	-
Pelladri Water	342 700	192 603	150 097	-	-	-	150 097
Sedibeng Water	553 368 156	42 713 725	85 319 447	33 296 932	36 019 714	356 018 338	510 654 431
Rand Water	626 912 879	598 444 303	28 468 576	-	-	-	28 468 576
Umgeni Water	156 470 688	152 189 556	4 281 132	-	-	-	4 281 132
TOTAL	2 120 355 714	884 838 385	150 831 921	61 233 569	63 302 428	960 149 411	1 235 517 329

Figure 7-1 Municipal Debt owed to Water Boards - December 2011

Source: DWA

At a meeting of Parliament's portfolio committee³⁴ on Water Affairs and Forestry, SALGA noted that this was due to several factors, namely that,

- several municipal billing systems were ineffective and outdated,
- in some cases there was no contract in place between water board and water service institution, and
- the accrual of interest on outstanding amounts.

7.1.6 Local government

The financial business model of a water service authority is closely regulated by the Municipal Finance Management Act, 2003 (MFMA). Important elements of the business financial model are:

- The Constitution (section 215) requires transparency, accountability and effective financial management and the processes to achieve this are set out in the MFMA;
- A municipality may set taxes and user charges but this must be in accordance with e.g. a tariff policy and is subject to any national guidelines;
- Expenditure, except in special circumstances, may only be in accordance with the approved budget;
- A municipality may incur short- and long-term, Rand denominated debt provided provision is made on the approved budget and further that the former must be repaid during the budgetary cycle and the latter is restricted to purposes of capital expenditure;
- A municipality may, by resolution of its council, provide security for any of its debt obligations;
- A municipality receives an equitable share of revenue raised nationally and distributed in terms of the Constitution, the Intergovernmental Fiscal Relations Act and the annual Division of Revenue Act; and
- The budget must be consistent with the national government's fiscal and macro-economic policies particularly those on inflation, administered pricing and equity;

³⁴ Parliamentary Monitoring Group. Water Boards' Annual Reports 2006/2007. Available: www.pmg.org.za. Accessed: March 2009

Finance decisions are preceded by the integrated development planning process required by the Municipal Systems Act. The water services development plan required by the Water Services Act becomes part of the IDP. A local authority may only budget for capital items that are included in the IDP.

The Council must approve the annual budget and may not delegate this function. The budget approval is the culmination of planning and budgeting processes that are closely prescribed by the Municipal Systems Act and the MFMA. The mayor plays the leading role in these processes.

Operational decisions are taken in terms of a delegation system and the mandatory service delivery and budgetary implementation plan (SDBIP).

While no breakdown is provided for water, in 2009/10, the municipalities sourced their capex as follows: Government grants and subsidies: R19.5bn (48%), external loans: R9bn (22%), public contributions and donations: R300m (0.7%) and R12bn (30%) from internally generated funds.³⁵ The high contribution from internally generated funds was expected to decline over the following 3 years, to a level of only 17%, with national transfers expected to make up the difference (by increasing to 58%). The Review indicates an increased reliance on national government transfers to fund local government's infrastructure investment.

Whilst borrowing has increased over the past 5 years, this has been driven by the public sector (almost exclusively the Development Bank of Southern Africa (DBSA)). The National Treasury review indicates that private lenders became more risk averse after the recession in 2008, and a major private lender to municipalities, namely the Infrastructure Finance Corporation (INCA), withdrew from the market in 2009 (citing declining margins due to competition from public sector lenders).

Several pieces of legislation govern aspects of municipal borrowing, notably the MFMA and its debt disclosure regulations as well as the PFMA. Section 45 of the MFMA allows municipalities and municipal entities to incur short term debt for bridging finance for operational purposes only. This has to be recovered within the financial year in which the debt is incurred. According to the National Treasury expenditure report, short term debt accounted for 6% of total municipal debt in 2010 - 70% of this being in the form of commercial paper – an interesting turnaround from three years before when most of it was simply in the form of overdrafts.

Section 46 of the MFMA permits long term debt for capital expenditure or the re-financing of certain existing long-term debt. The treasury expenditure review reports that long term loans amount to approximately 64% of total local government debt.

To date, only the City of Cape Town, Johannesburg and Ekurhuleni have issued municipal bonds (totalling R11.8bn). Bonds have the benefit of allowing municipalities to negotiate the payment periods and interest rate payments whilst offering investors better interest rates than most other savings schemes.

³⁵ National Treasury's Local Government Revenue and Expenditure Review, 2011

Independent empirical research has been conducted into municipal borrowing³⁶. The purpose was to establish the effect of municipal borrowing on infrastructure service delivery. The methodology was based on 66 interviews with stakeholders, including 29 municipalities and some quantitative analysis. The theoretical framework was the triad of a regulatory framework, a supply side of financial institutions and a demand side of borrowers. Together these must create a functioning and liquid sub-national capital market. This follows the Gurria Task Force contention that internationally not enough had been done on the demand side of financing.

As far as the regulatory framework is concerned the research found that legislation and regulation was in general conducive to market formation. It lies between a market-based approach and a co-operative system. The important elements of transparency, competition, sound financial management and accountability are present.

The demand side was limited by capacity constraints, poor tariff collection, insecurity and lack of predictability over future functions and revenues and a legacy of a conservative approach to borrowing by municipalities.

On the supply side there were a number of public and private institutions offering finance but an important aspect was that the DBSA, using concessionary public money, competed strongly and was “crowding-out” the private sector. Consequently, the DBSA held the greatest share of outstanding debt. This was contrary to international opinion that the markets should be led by the private sector.

Other outcomes from the research included:

- the threshold for a municipality to issue bonds, determined largely by cost-effectiveness, was so high, relative to loan rates, as to exclude most municipalities from the market;
- the quantum of government grants available, relative to the capacity to implement infrastructure, was a discouragement to borrowing;
- the much promoted international recommendation for bond pooling is already present in the form of the DBSA (public sector) and INCA (private sector);
- the potential for retail and revenue bonds is mooted but their viability is not established by the research;
- only 25 municipalities had made use of rating services to establish their creditworthiness;
- credit enhancement techniques such as guarantees are evident but their use should be encouraged; and
- the tendency in the South African market to lend against the balance sheet (“general obligation lending”) rather than for projects is noted and consequently that lenders only have a limited influence on the way projects are implemented.

³⁶ Liebig K et al Municipal Borrowing for Infrastructure Service Delivery in South Africa – a Critical Review. Study 34. German Development Institute. Bonn 2008.

7.2 Energy - Eskom

7.2.1 Mandate

Eskom is a State-Owned Company wholly owned by the South African government. Eskom generates approximately 95% of the electricity used in South Africa and 45% in Africa. Eskom is responsible for generating, transmitting and distributing electricity to customers in the industrial, mining, commercial, agricultural, and residential sectors and to redistributors. Thus Eskom's operations have a macroeconomic impact beyond the energy sector. The Infrastructure development is aligned with national planning and economic development initiatives.

7.2.2 Governance

Eskom is regulated under licences granted by the National Energy Regulator of South Africa (NERSA) in accordance with the Electricity Regulation Act (4 of National Energy Regulator of South Africa (NERSA) 2006) and receives revenue based on NERSA-approved set tariffs. Eskom is regulated by separate licences for the generation, transmission and distribution of electricity. It also has a nuclear licence from the National Nuclear Regulator, which regulates the operation of its nuclear power station and all elements of the nuclear value chain.

Eskom is also subject to the authorisations issued by other relevant authorities like the department of Environmental Affairs and provincial and local government in order to protect the public interest and the environment. As Eskom is a public company, it is governed by the legislative framework encompassing the Companies Act, the National Environmental Management Act, and Public Finance Management Act etc.

7.2.3 Nature of infrastructure

A capacity expansion program was implemented in 2005 which aims to increase Eskom's generation capacity and transmission lines. The current build programme is up to the year 2018 and entails maintenance, refurbishment and technical planning projects to enhance plant performance ensuring that the existing infrastructure accommodates the current demand as well as to diversify the energy sources. Additional power stations and major power lines are being built. The program has cost R140 billion up to 31 March 2011.

Eskom has approved and committed to the following projects:

- Building the Medupi and Kusile coal-fired power stations, two new gas-turbine plants, and the Ingula pumped storage plant
- Recommissioning three coal-fired plants that were previously mothballed
- Upgrading other existing plants
- Building new infrastructure, including new transmission lines and two renewable energy plants.

7.2.4 Business Model (Sources of funds and financing mechanisms)

The programs mentioned above (including the capacity expansion) are estimated to cost approximately between R450 billion and R500 billion (excluding capitalised interest) up to 2017.

The South African Government as the shareholder has committed R430 billion to Eskom consisting of the following:

- R350 billion in guarantees, including an additional guarantee of R174 billion provided in October 2010 (R106 billion of the guarantees have been committed)
- R60 billion subordinated shareholder loan received in full
- A proposed R20 billion equity recapitalisation over the next three years

Eskom aims to obtain R40 billion per year over the next three years in loans from local and international debt capital markets and development finance institutions (DFIs) such as the European Investment Bank, the African Development Bank and the World Bank. DFIs generally bring concessionary terms, and contract with Eskom on the strength of Eskom's shareholder in projects that support regional growth. Access to debt capital markets depends on an independent assessment of Eskom's creditworthiness as per the credit ratings as issued by the different credit rating agencies. The different rating agencies raised concerns about the ability of Eskom to raise financing based on its balance sheet to meet the huge infrastructure investment requirements. However this has been mitigated by the strong support of the Government as the shareholder.

Eskom has secured financing from the African Development Bank (ADB) and the Clean Technology Fund (a climate investment fund that promotes the transfer of low carbon technologies) for the Sere Wind farm and the Upington solar plant project. The loans are guaranteed by the South African government. The financing is part of a broader financing plan for Eskom's renewable projects, which includes sourcing from other development finance agencies. With the introduction of Basel III³⁷ there have been constraints on banks on implementing project finance. Eskom is thus looking at the possibility of introducing equity and in so doing increase the private sector involvement in financing. Eskom is also looking at tapping into the Asian markets, China specifically. The Chinese government would provide the windmills and the financing of the windmills.

In implementing these financing models, any additional resources like staff required has been outsourced and any risks such as interest rate risk, currency risk, etc. has been hedged with derivatives such as interest rate swaps and cross currency swaps.

7.3 Transport

The Department of Transport has created two major public entities to manage transport infrastructure in South Africa: Transnet and SANRAL.

7.3.1 Transnet³⁸

7.3.1.1 Mandate

Transnet is a wholly owned State enterprise operating a network of rail freight, ports and pipeline assets across South Africa.

As per the 2011 Annual Report, Transnet's mandate is: "(i) to assist in lowering the cost of doing business in South Africa, thereby enabling economic growth; (ii) to ensure security of supply through the provision of appropriate port, rail and pipeline infrastructure; and (iii) to manage operations in a cost-effective and efficient manner within acceptable standards."

³⁷ Basel III is a global regulatory standard on bank capital adequacy, stress testing and market liquidity risk agreed upon by the members of the Basel Committee on Banking Supervision

³⁸ Transnet annual report, 2010

Transnet's mandate and strategic objectives are aligned with Government's New Growth Path (NGP) and the Statement of Strategic Intent (SSI) issued by the Minister of Public Enterprises.

7.3.1.2 Governance

Transnet is made up of the following operating divisions:

- Transnet freight rail (formerly Spoornet – the freight rail division)
- Transnet rail engineering (formerly Transwerk - the rolling stock maintenance business)
- Transnet national ports authority (formerly the NPA - fulfils the landlord function for South Africa's port system)
- Transnet port terminals (formerly SAPO - managing port and cargo terminal operations in the nation's leading ports), and
- Transnet pipelines (formerly Petronet - the fuel and gas pipeline business, pumps and manages the storage of petroleum and gas products through its network of high-pressure, long distance pipelines).

The National Energy Regulator of South Africa (NERSA) sets tariffs for Pipelines, while the Ports Regulator of South Africa (Ports Regulator) regulates National Ports Authority.

7.3.1.3 Nature of infrastructure

Transnet has embarked on a growth strategy where Transnet plans to invest R110.6 billion on infrastructure developments for the five year period 2012 to 2016. The largest share of the capital investment, R65.3 billion over the next five years, is budgeted for rail consisting of maintenance and upgrading of rolling stock, maintenance of infrastructure, expansion of the coal and iron lines, purchasing locomotives and equipment and increasing capacity for transporting coal to Eskom. R28.3 billion is budgeted for Ports Operating divisions to improve capacity in the Port of Durban, expand the Cape Town Container Terminal and buying port equipment, including cranes, straddle carriers, tug boats and marine craft. Pipeline has a budget of R15 billion mostly for the New Multi-Product Pipeline (NMPP) which is the pipeline between Durban and Jameson Park, Gauteng and some for the existing Durban to Johannesburg Pipeline(DJP) until the NMPP is fully operational.

7.3.1.4 Business Model (Sources of funds and financing mechanisms)

Transnet have a self-financing method where they rely on the strength of their balance sheet without reliance on government subsidies or guarantees. In July 2012, Transnet issued its \$1 billion Eurobond in the United States with a 10-year maturity without a government guarantee. Transnet has a structured financing strategy which entails raising cost-effective financing ahead of demand by maintaining a financing buffer of between R3 billion and R6 billion and diversifying by having local and international financing.

The main source of financing is the commercial paper programme and long-term bonds which are part of the Domestic Medium Term Note (DMTN) programme. The other sources of financing include export credit agencies, Development Finance Institutions (DFIs) namely the French Development Bank (AFD) and Japan Bank for International Cooperation (JBIC), and international bonds under the Global Medium Term Note (GMTN) programme. The GMTN programme enables the company to issue bonds in the dollar, euro and pound market. They have also started negotiations with the African Development Bank (ADB) to establish a substantial loan facility. Loans

from the Development Finance Institutions are used to finance specific projects, commercial paper for short-term needs and the export credit agencies to finance imports.

Due to the major projects planned, Transnet are also looking at innovative means of obtaining financing. These entail asset backed financing to finance equipment and Private Sector Participation (PSP), Public Private Partnerships (PPP), project finance, leasing and syndicated loans to finance the large projects.³⁹

7.3.2 Sanral

7.3.2.1 Mandate

Sanral is a state owned entity established in 1998 and is accountable to parliament via the Minister of Transport. The organisation is responsible for South Africa's large network of non-toll roads and toll roads.

7.3.2.2 Business Model

Currently, at Sanral, all non-toll roads are financed by National Treasury and toll roads are financed by capital and money markets, PPPs or structured finance. There are no special arrangements like trusts and SPV structures in place at Sanral and all financing is in local currency.

The revenue streams from the capital markets like the Domestic Medium Term Note (DMTN) is not ring-fenced for specific projects. However, for the structured financing in the form of the European Investment Bank (EIB) and Export Credit Agencies, the revenues have been allocated to specific projects. The financing from EIB was only secured after the project had significantly progressed as this is one of the stipulations of the loans.

7.3.2.3 Gauteng Freeway Improvement Project

The plan was to repay the loans as well as cover the future operation and maintenance of these roads via the user-pay principle by an electronic and automated method referred to as e-tolling.

However, in April 2012, the High Court in Pretoria ordered the suspension of the start of tolling on GFIP, pending a review of the decisions to toll those freeways. This halting on collection of fees has had serious implications for Sanral. Treasury has provided a three year term loan. But the loan is not sufficient and the enterprise has had to explore alternative financing mechanisms to ensure that they are able to meet the debt obligations as they mature. Sanral is exploring monthly auctions where they can tap into the markets on a regular basis as well as international financing, BOT and PPP opportunities where the financing will be ring fenced for specific projects.

³⁹ Transnet expansion to fund itself, Rising Revenue to repay 70% of investment, Business Report, 9 May 2012

8 Appendix B - International case studies

8.1 China

8.1.1 Overview

In China, direct fiscal support is declining. In the past, government financing took the form of direct fiscal support and what is referred to in China as “land premium”⁴⁰. In recent years, central and local governments have tended to assign a larger role to debt instruments.

8.1.2 Institutional structure

There are many institutions forming part of the water value chain at all levels from central government through provincial, to municipal level. The framework is quite complex and has resulted in implementation and enforcement of regulations being a challenge.

8.1.3 Financing models

Bank loans have been the major source of financing for infrastructure projects. State-owned commercial banks and policy banks⁴¹ hold around 80 % of total infrastructure loan portfolios, and bank financing accounts for more than half of total infrastructure financing.⁴² Among the most important lenders is the China Development Bank, a policy bank set up in 1994 to provide long-term financing for key projects supported by the state.

Local governments are actively involved in financing infrastructure projects. They provide guarantees (implicit and explicit) for bank loans to infrastructure projects. In some cases, they provide subsidies directly for infrastructure SPV's.⁴³

Corporate bonds have become more important, but remain a small share in total financing as the bond market remains underdeveloped. These bonds are guaranteed by public banks or other associated companies increasing credit ratings to levels that allow commercial banks and insurance companies to invest.

Local governments in China are not allowed to borrow directly. However, municipally owned utility companies are allowed to borrow from the China Development Bank, other Chinese banks and international financial institutions (World Bank, Asian Development Bank (ADB) and bilateral donors such as the Japan International Cooperation Agency (JICA) and the German KfW. In regions that are not economically developed, the local governments can enter into State bond programs. The bonds tend to have long maturities and low interest. They are issued by the Ministry of Finance, and then distributed by the National Development and Reform Commission.

⁴⁰ Land premium is the proceeds that the authorities receive from real estate developers for the use of land previously acquired by the authorities after deducting the associated cost of land acquisition.

⁴¹ Policy banks were established in 1994 to take over the government directed spending functions of the state owned commercial banks. These banks, the Agricultural Development Bank of China (ADBC), China Development Bank (CDB), and the Export-Import Bank of China (Chexim), are responsible for agricultural development projects in rural areas, infrastructure financing and trade financing respectively.

⁴² IMF Working Paper, Asia and Pacific Department, Financing Infrastructure in India: Macroeconomic Lessons and Emerging Markets. Case Studies, James P. Walsh, Chanh Park and Jiangyan Yu, August 2011

⁴³ *ibid*

Municipal governments provide their financing in the form of equity that typically is not remunerated. The other forms of financing require remuneration either in the form of interest on loans or profits on private equity.

In most rural areas in China, self-financing is encouraged as the areas can choose the sanitation solutions they can afford.⁴⁴

8.1.4 Private sector participation

Private sector participation in financing infrastructure and managing services is widespread. In 2007 there were over 50 water projects and well over 100 wastewater projects in China with private sector participation.

8.1.4.1 Build-Operate-Transfer (BOT) contracts.

BOTs are a popular financing mechanism for water and wastewater treatment plants and bulk water supply systems. The private sector is in charge of large upstream or downstream infrastructure without being directly involved in serving users. Experience with BOT contracts has been mixed. For example, SUEZ built a water treatment plant under a BOT contract in Lianjiang. However, water demand was overestimated resulting in the plant laying idle while local government had to pay for substantial minimum volumes without using them. This pushed up tariffs and after lengthy negotiations, the local government bought back the plant in 2009.

8.1.4.2 Shenzhen concession.

According to a study by the Asian Development Bank, the city of Shenzhen is leading the reform of local water management in China. In 2001, the city combined all water-related government functions into one government agency and regulatory and operative functions were separated. In 2003, a 30-year concession for municipal public utilities was bid out in Shenzhen. This was won by the French firm Veolia and its Chinese partner Capital Water. Veolia holds 25%, Capital Water 20% and State Council Committee 55% of the shares of a newly created Joint Venture called Shenzhen Water. The \$40 million equity stake of Veolia is covered by a 15-year Multilateral Investment Guarantee Agency (MIGA⁴⁵) guarantee to protect against the risk of expropriation. In 2009 Shenzhen Water was the largest water supply and sanitation enterprise in the country. AS a result of this concession, sewage treatment rate in the Shenzhen Special Economic Zone has increased. The Asian Development Bank called the Shenzhen case "a model for market-oriented reform in the urban water sector".

8.1.4.3 The Hyflux Water Trust

One of the innovative financing models in the water sector is the Hyflux Water Trust (HWT). This is an example of using equity stakes to leverage other forms of financing. The trust was launched on the Singapore stock exchange in 2007. The trust is 31.5% owned by Hyflux (also listed on the Singapore exchange) and the rest by the public. Hyflux's main activities include development, manufacture, and sale of water treatment and desalination plants, as well as installation and commission of systems. The HWT is responsible for operating and managing all of Hyflux's BOT

⁴⁴ http://en.wikipedia.org/wiki/Water_supply_and_sanitation_in_the_People's_Republic_of_China

⁴⁵ MIGA is a member organisation of the World Bank group that offers political risk insurance. The Agency was established to promote foreign direct investment into developing countries.

contracts and has the right of first offer and first refusal for all new projects. This arrangement enables Hyflux to pursue an “asset light” capital structure. This thus frees up the capital invested in plants and Hyflux is able to develop new projects.⁴⁶

8.1.5 Hydropower

The Three Gorges Dam is the largest hydroelectric dam in the world. It is located in the middle of the three gorges on the Yangtze River, the third longest in the world, in the Hubei Province of China. Controversy about the project arose from human rights issues (as many as 1.3-1.9 million people have been forced to relocate) and environmental impacts. The main aim of the project was flood control, power generation, navigation and tourism. The China Development Bank has been the main lender, loaning \$3.6 billion. Government export credit agencies loaned the project \$1.4 billion. The remainder of the financing has been funded internationally by companies, export credit agencies and banks from Canada, Switzerland, Germany, France, Sweden and Brazil.⁴⁷

8.1.6 Lessons learnt

The primary lesson appears to be that China has funded its water infrastructure development by moving away from direct fiscal support to instead placing increasing reliance on bank loans – both local and international, both commercial and concessionary (or at least developmental).

It appears that the State’s role has changed during this transition, from direct funder to the provider of subsidies, guarantees, concessions and partnerships. A benefit of this changing role is the ability to leverage a far greater infrastructure spend than would be possible if financing everything internally.

8.2 Philippines

8.2.1 Overview

The Philippines has predominantly financed their water infrastructure from government loans, loans from the Development Bank of the Philippines (DBP) and the Land Bank of the Philippines (LBP) which channel financing from the World Bank. Other sources of finance include Official Development Assistance (ODA); Government owned and controlled corporations (GOCC), Government Financial Institutions (GFI) loans and commercial loans. Private sector participation has been encouraged by way of Build Operate and Transfer (BOT) and Joint Venture Projects.

8.2.2 Institutional structure

There are many small institutions in the Philippines water sector with different regulations, insufficient autonomy, lack of co-ordination and co-operation, and political interference which has resulted in a lack of accessible, timely and uniform information from one source. This lack of financial transparency and the low creditworthiness has led to limited investor interest and thus limited international financing.

Due to the fragmentation of the water sector, the main reform that has had an impact on private sector financing was enhancing regulatory clarity by strengthening the National Water Resource Board (NWRB), support for an Independent Water Regulatory Commission and Public Investment

⁴⁶ Innovative financing mechanisms for the water sector, OECD report 2010

⁴⁷ The Three Gorges Dam Project Funding, <http://www.mtholyoke.edu/~lpohara/Pol%20116/funding.html>

Rationalisation (PIR). The PIR framework is built on the prioritisation and allocation criteria based on economic and social objectives.

8.2.3 Financing models

In recent years, the government of the Philippines has been trying to obtain other sources of finance and has been trying to establish a framework for attracting private-sector finance. The government has established a PPP framework that provides guarantees for contractors and concessionaires against regulatory risk.⁴⁸ The Local Government Unit Guarantee Corporation (LGUGC) was established to provide credit guarantees for municipalities that seek to finance infrastructure projects through debt issuances.⁴⁹ The primary mandate of LGUGC is to provide LGUs access to private capital by providing credit enhancements to LGU debt. This enables LGU's to enter the capital markets. LGUGC has a co-guarantee agreement with the US Agency for International Development (USAID).⁵⁰ This reinsurance strengthens LGUC's ability to co-ordinate private capital lending for water supply and sanitation facilities in the Philippines.

In 2004 as per the Executive Order (EO) 279, creditworthy water utilities were mandated to start using market-based financing and not government based financing.⁵¹ This led to the Philippine Water Revolving Fund (PWRF) being initiated which leveraged government funds, Official Development Assistance (ODA) funds and private sector funds. The objective of this initiative was to improve the governance and efficiency of the water sector. This initiative targeted three areas that were considered to be a hindrance for private financial institutions (PFI's) to enter the water sector. The three risk areas identified were credit risk, operational risk and political risk.

In order to address the credit risk aspect, the PWRF focussed on improving potential creditors' understanding of the water utility business models by providing nationwide training on how to evaluate water projects. In addition to this, the PWRF and the LGUGC created a risk rating system whereby water utilities were empowered to understand how to improve their credit scores and how to access cheaper financing as well as providing the PFIs with a comprehensive understanding of the water utilities' credit worthiness. PWRF also enabled water utilities to obtain affordable lending terms by blending concessional and PFI financing. This was done by a co-financing arrangement mixing public and ODA funds, re-lent through the Development Bank of the Philippines, with internal funds from PFIs.

PWRF aimed to increase the operational strength of the utilities to enable them to be more attractive to PFIs. Utility reforms included training utilities to draft viable business plans, training in project development and establishing the Water Operations Partnership (WOP) Programme. WOP was pivotal in its role through knowledge sharing, mentoring, and benchmarking in areas such as water quality and strategic planning.

⁴⁸ Emerging Markets, News, Analysis and Opinion, Infrastructure: Changing Lanes, 05/05/2011, Nicholas Lord

⁴⁹ Platz, Daniel (2009), Infrastructure finance in developing countries—the potential of sub-sovereign bonds, DESA Working Paper No. 76ST/ESA/2009/DWP/76

⁵⁰ <http://www.lgugc.com/about.htm>

⁵¹ Jeremias N. Paul, Jr, Making Water Reform Happen: The experience of the Philippine Water Revolving Fund, October 2011

8.2.4 Privatisation

Water privatization in Philippines began in 1997, when two concession contracts were entered into in which MWSS retained the ownership of the infrastructure and the two concessionaries were given the responsibility of operation and management of the facilities. The two concessionaries were the Maynilad Water Services, Inc (MWSI) (a joint venture between the French Suez and the Filipino Benpres Holding) in the West and Manila Water Company, Inc (MWCI) (consisting of the Filipino Ayala Corporation as well as the British United Utilities, the U.S. company Bechtel, and Japanese Mitsubishi) in the East.⁵²

The contracts were entered into for a period of 25 years but MWSI went bankrupt in 2003. Some of the reasons that contributed to the demise of the concessionary were that there was no competitive bidding in the awarding of contracts to Suez, and staff from the mother company who had no experience in water supply were brought into the new MWSI causing problems with the existing staff. MWSI also inherited foreign currency debt which caused financial difficulties.

MWCI on the other hand underwent competitive bidding and initially borrowed in local currency only and only in small amounts. They limited new staff from the new company and rather trained former MWSS staff in the relevant fields and in so doing gained their trust. MWCI also focused on reducing non-revenue water by using a “territory management” approach. The success of MWCI is also attributed to the fact that the operating units were decentralised and were given responsibility for their own actions and compensation and evaluation was based on performance. These policies followed by MWCI led to profitability and in turn led to investor confidence and as a result they were able to obtain further loans.

8.2.5 Lessons learnt

The Philippine Water Revolving Fund (PWRF) reform was a gradual process and highlighted the importance of innovative financial mechanisms but more importantly the fact that in order for a reform to be successful, a strategic and regulatory reform is necessary. The financing reforms in the Philippines have been accompanied by policy reforms like strengthening regulation and institutions. These reforms have been successful in attracting the private sector by identifying and addressing the three risk areas of credit risk, operational risk and political risk. These risks were addressed by having a multifaceted approach of training, institutional strengthening, better credit ratings and blending different financing mechanisms to obtain affordable lending terms.

8.3 Mexico

8.3.1 Overview

Mexico has a unique set of water resource management challenges, and has developed a complex, decentralized method of managing and financing investments in water resources to meet those challenges. The country has uneven water availability, with an arid northern half that is seriously water constrained, and a southern half that is less constrained but still suffers from the problems that affect the entire country such as pollution and inefficient use of water.

⁵² http://en.wikipedia.org/wiki/Water_privatization_in_the_Philippines

A key element for meeting Mexico's goals in the water sector has been undertaking more investment in water resource management infrastructure. The source of revenues for water management is as follows:

- General government revenue
- Fees for water use and discharge

Use is also made of debt to finance investment in infrastructure.

At present, the lack of cost recovery through user fees is one major impediment to meeting investment needs in the sector. As a result, third-party financing is difficult to raise, and the sector therefore relies almost entirely on government subsidies to meet its investment needs. The funds for these subsidies come from a variety of sources such as tax revenue and petroleum royalties, and are disbursed through a variety of programs, the largest of which are programs managed by CONAGUA. However, despite the present challenges, the Mexican government continues to investigate innovative ways of increasing cost recovery or engage public finance tools in water resources management and these offer useful lessons and insights.

8.3.2 Institutional structure

The Mexican Ministry for the Environment and Natural Resources (**SEMARNAT—Secretaría del Medio Ambiente y Recursos Naturales**) is the Government agency with stewardship of the water sector. Unlike the South African ministry, the Mexican ministry is not involved in directly managing water resources or infrastructure. Its role is primarily as an environmental regulator. The government's roles in water resource management, and managing large infrastructure assets, have been devolved to the National Water Commission (**CONAGUA—Comisión Nacional del Agua**), an independent agency. The Ministry appoints the board of CONAGUA.

CONAGUA is the federal government body with the greatest responsibility for water resource management in the country. CONAGUA is in charge of managing water resources in the country, and its main functions include the development of the national water policy; administering the rights for water use and wastewater discharge; planning, developing, financing, and operating all water infrastructure of national importance (including certain irrigation infrastructure and drainage systems); managing emergency and natural disasters and managing investment in the water sector in Mexico.

CONAGUA funds the majority of its activities with direct budgetary transfers from the Federal Government and also with the payments it receives for water use and wastewater discharge duties. It disburses those funds back to states and municipalities through a variety of programs (more on these below).

Mexico has 13 **River Basin Organizations (organismos de cuenca)**, each of which is responsible for a hydrological-administrative region based on catchment boundaries. These are the regional implementing agencies of CONAGUA. Water rights are then allocated by **River Basin Councils (consejos de cuenca)**. River Basin Councils, of which there are 26 in place, are the locus of decentralized decision making regarding integrated water resources management. These councils are designed to represent the interests of all water users in a given basin, and plan programs and investments to maintain and improve infrastructure, and preserve the basin's resources.

Large irrigation schemes are managed through **Water User Associations**, which are comprised of users of a particular scheme. The responsibility for water services in Mexico rests with **municipalities** who are able to delegate service provision to a third party, such as a private contractor. Some water treatment plants have been contracted through Build-Operate-Transfer contracts to provide bulk water to municipalities.

Finally, the **National Infrastructure Fund (FONADIN—Fondo Nacional de Infraestructura)** was established in Mexico in 2008 in order to support infrastructure projects that leverage private investment.

8.3.3 Financing models

8.3.3.1 Financing Water Resource management in Mexico

Mexico has a complex, decentralized institutional framework for managing and investing in water resources. The Federal Government provides most funds for managing water resources, but many decisions regarding allocation of funds and infrastructure planning take place at the sub-national level, including states, municipalities, and river basin committees.

Mexico has taken some steps to introduce commercial financing, but overall use of private sector participation (PSP) has been concentrated in wastewater treatment plants, and subnational financing is not generally accessed directly by water and sanitation providers.

Most investments in infrastructure for managing water resources are made through grants provided by the Federal Government (primarily through CONAGUA) to states and municipalities and water and sanitation providers. The following sources of funds are available for managing water resources:

- **General government revenues**—The Federal Government finances its contributions to the water sector from taxes and oil revenues. It is also able to balance its budget using international loans.
- **Fees for water use and discharge**—water use and wastewater discharge duties paid to CONAGUA
- **Proceeds from debt**—including federal, state, and municipal bonds issued in Mexico and abroad, and concessional and commercial loans from financial institutions. Noting that debt proceeds are a source of funds for capital investment, but will need to be repaid – primarily from the first two sources listed above.

The Mexico example offers some useful insights into public bond markets for infrastructure financing, raising commercial finance and creating institutions to raise finance and manage funds. These are detailed below.

8.3.3.2 Experience with instruments for raising revenues

Mexico has one of the best-developed sub-national bond markets in the developing world. A total of 31 Mexican states (out of 31) and 70 municipalities have credit ratings – the second highest number of sub-national credit ratings outside the United States and Canada. A World Bank structural adjustment loan in 1992 helped kick-start reforms leading to this high level of sub-national bond activity. More recent legislative reforms have helped further expand the market. For instance, a 2001 law helps local government expand their capacity to manage debt. The law mandates that

states and municipalities establish a trust for repaying general obligation bonds, which is funded by the federal “tax participation” payments collected by the national government and redistributed to states and municipalities. These funds, earmarked for debt repayment, are isolated from local governments’ general accounts, leading to lower borrowing costs than would be achieved without the trust.

Notwithstanding the well-developed bond markets, these have not been a significant source of direct financing for the water sector. Water utilities have not been able to borrow on commercial terms, given the inability of most water utilities to recover costs. Instead, the bond issuance is often a source of general financing for local governments, which in turn use the proceeds to subsidize water investments.

Mexico is pursuing a number of innovative sub-national financing strategies that could have implications for financing the water sector. Overall, the bond market and commercial finance has the potential to provide substantial sums of money for water infrastructure development and reduce the level of public subsidy, although that potential has yet to be realized in Mexico. In general, the Federal Government provides well over 50% of financing for investments in the water sector, with state government subsidies accounting for around 10%. Private debt and equity covers a small per cent of investments. In order for commercial finance to be a viable source of financing for the water sector, cost recovery and efficiency would have to improve. One way to improve the incentives for cost recovery and efficiency would be through greater private-sector participation.

8.3.3.3 Pooled finance

The State of Quintana Roo, with the support of USAID/EDI Global Development Alliance Program, created a bond bank in 2006, the Quintana Roo (QR)-Bond Bank. The QR-Bond Bank is a pooled financing vehicle which intercepts different revenue streams and pledges them to pay for debt obligations, so as to increase the credit rating of the borrowing entity.

In October 2007, the QR-Bond Bank helped the State Commission for Water and Sanitation (Commission de Aqua Potable y Alcantarillado, CAPA) to access an amount – in local currency equivalent to USD 30 million dollars – from the domestic capital markets. Terms and Conditions were unprecedented in Mexico for a water entity. The bank loan from Citibank had a 15 year term and was provided at inter-banking rate plus 19 basis points on the back of a transactional rating of AA.mx, when other water utilities in Mexico were hardly obtaining any financing or only through short term loans (approximately 3 to 6 years) at 400 to 600 basis points over inter-banking rate. The Federal Government matched this financing by providing another USD 30 million.

The bond bank helped overcome a number of constraints that had been preventing the State of Quintana Roo from building an effective and consistent financing framework in the water and sanitation sector. Water utilities are not considered as federative entities and therefore receive no national tax transfers. Water Bill collection rates are relatively low, as the Federal Constitution of Mexico guarantees water supply to citizens, even if they do not pay for it and the culture of non-payment for infrastructure services is widespread. In spite of the continued focus and improved management of payment levels, this means that revenue streams are not perceived as secured by potential investors. Finally, the Mexican municipal bond market in general lacks enough credit insurance products for potential municipal issuers. In an arena where municipal credit ratings are

low compared to domestic investment grade standards, credit enhancement becomes a key necessity.⁵³

8.3.3.4 *Experience in commercial finance*

In Mexico, the use of private sector participation (PSP) contracts in the water and sanitation sector has been limited. With more than 1,200 water and sanitation providers in the country, only about 32 PSP contracts have been signed; of these, about 70% have been Build-Operate-Transfer (BOT) contracts. These contracts have been effective ways of raising funds for investments in facilities for treating water, treating wastewater, and desalination. However, whilst BOT contracts increase the capacity to supply potable water and treat wastewater, they do not improve the level of efficiency of the water and sanitation providers and do increase the cost of service.

Recognizing the importance of increasing the operating efficiency of water and sanitation providers, and the potential for PSP contracts to contribute to this objective, CONAGUA and other Federal Government entities are pursuing efforts to increase this type of private management and operation of water and sanitation providers, through the Water Utilities Modernization Program (PROMAGUA), which intends to improve efficiencies, make structural changes and include private sector participation (PSP) in the water utilities. For example, CONAGUA and Banco Nacional de Obras y Servicios Públicos, SNC (National Works and Public Services Bank) (BANOBRAS) are working with a number of municipalities to develop and implement contracts for Integrated Management Improvement (MIG—*Mejora Integral de Gestión*). The objective of this new type of contract is for the private operator to directly manage the utility—thereby leading to increases in operating efficiency—and also to provide financing for capital investments.

The estimated amount of investment required is \$650 million pesos (R400 million) (not including value added tax). The Federal Government will provide grants to cover 40% of total investments required, whilst the private company is responsible for contracting and repaying the debt (35% of total investment requirements). Debt service will be covered through payments from the contractor (a municipality). The equity contribution (25% of total investment requirements) will be recovered through payments from the contractor as the private operator meets objectives for efficiency improvements.

8.3.3.5 *Creating institutions to raise finance and manage funds*

The establishment of the National Infrastructure Fund (**FONADIN—Fondo Nacional de Infraestructura**) is the Government's main reform effort to reduce costs by mobilizing private funds for developing infrastructure. The Mexican Government created FONADIN in 2008 as a vehicle for financing investments in water and other infrastructure. Private companies must invest equity for a project to be eligible for receiving financing from FONADIN.

FONADIN can provide financial assistance either as grants or reimbursable support. The reimbursable support can include financing of studies, guarantees (such as loan guarantees, performance guarantees, and political risk guarantees), subordinated and/or convertible loans, and even equity contributions. The non-reimbursable support can be provided through contributions or subsidies. Contribution can be used to cover the costs of studies or consultancies or the costs of

⁵³ Innovative Financing Mechanisms for the Water Sector – OECD 2010

developing infrastructure projects with a high degree of social return. These projects must incorporate private sector participation and have their own source of revenues. Subsidies are awarded to achieve financial equilibrium in projects that are expected to have a high social return, but with low financial returns.

Government entities as well as private companies are eligible to receive support from FONADIN. To be eligible private companies must be the beneficiaries of concessions, licences or contracts that permit public-private partnerships. To date, FONADIN has approved over US\$1.5 billion in financing for projects in water and sanitation. The largest of these is the Atotonilco wastewater treatment plant for a sum of about US\$700 million.

8.3.4 Lessons learnt

There are many similarities with South Africa – namely the high reliance on financing from central government, and the increasing push to access commercial sources for the financing of water infrastructure. Interesting lessons that can be learned from the Mexican experience include the establishment of the National Infrastructure Fund, and its requirement that projects must include a portion of private equity to be eligible for access to the Fund.

The focus on improving efficiency and revenue collections highlights the same challenges that face South Africa, and the importance of addressing these two issues, given the impact they have on accessing further financing. Mexico's approach, through its PROMAGUA program, is to introduce more private sector involvement in the management of water utilities. Naturally this requires well managed contracts with the appropriate balance between commercial profits and profit-driven cost savings.

8.4 Investment in Africa

8.4.1 Overview

It has been difficult obtaining international financing in most African countries, due to the low credit worthiness (low or no sovereign credit ratings) and the limits of local financial markets. The regulatory and political interference in infrastructure development has also been a deterrent.

In Countries such as Cameroon, Nigeria and Tanzania, macroeconomic and institutional changes and financial sector reforms have been shown to increase longer-term local currency financing for banks and therefore increase local bank financing for infrastructure projects.⁵⁴

8.4.2 Chinese investment model⁵⁵

The Chinese investment model has become a major force – especially in Africa and Eastern Europe. Recent years have seen growth in the financing activities of “emerging partners” with China being by far the largest. By 2006, the investment by emerging partners in African infrastructure roughly equalled the investment channelled through Overseas Development Assistance (ODA) and that of the private sector. The conditions attached to these investments are commercial and there is no attempt to influence the policies of the host nation. Most investment is channelled through an

⁵⁴ Financing Infrastructure in Africa, How the region can attract more project finance, Gridlines, Note No.13, Sept 2006

⁵⁵ World Bank: Building Bridges: China's Growing Role as Infrastructure Financier for Sub-Saharan Africa. Trends and Policy Options. No.5. 2008.

export – import agency. It is sometimes characterised as the “Angola Model” where natural resources are used to secure debt and even to repay it directly. Most of this financing has gone to railways and hydropower with no identified projects in the water services sector.

By the end of 2007, China was providing at least US\$3.3 billion toward the construction of 10 major hydropower projects amounting to more than 6,000 megawatts (MW) of installed capacity. If completed, these schemes would increase the total available hydropower generation capacity in sub-Saharan Africa by around 30 percent. Water and sanitation account for a relatively small share of China’s total financial commitments to African infrastructure development. Participation in confirmed projects was about US\$120 million, and another estimated US\$200 million went into Angola’s water sector as part of the China Ex-Im Bank credit line of 2004. Most of these projects were smaller scale in nature and more focused on meeting immediate social needs. China’s water supply projects include a number of smaller dams that are not related to hydropower but directly to water supply, in Cape Verde and Mozambique.

Unlike traditional ODA, Chinese infrastructure finance is channelled not through a development agency but through the Ex-Im Bank, which has an explicit mission to promote trade. Given the export promotion rationale, the tying of financial support to the participation of contractors from the financing country is a typical feature. A similar approach is being taken by the India Ex-Im Bank and has in the past been used by export credit agencies of other countries.

Ex-Im Banks provide credits to buyers and exporters to support the trade of goods. These credits include the provision of loans, concessional or otherwise, for the building of infrastructure. The China Ex-Im Bank is increasingly making use of a deal structure— known as the “Angola model” or “resources for infrastructure”—whereby repayment of the loan for infrastructure development is made in terms of natural resources (for example oil). This approach is by no means novel or unique, and follows a long history of natural resource-based transactions in the oil industry. In the case of the China Ex-Im Bank, the arrangement is used for countries that cannot provide adequate financial guarantees to back their loan commitments and allows them to package natural resource exploitation and infrastructure development.

The China Ex-Im Bank’s terms and conditions are agreed on a bilateral basis, with the degree of concessionality depending on the nature of the project. On average, the Chinese loans offer an interest rate of 3.1 percent, a grace period of 4 years, and a maturity of 13 years. However, there is significant variation around all these parameters across countries with interest rates ranging from 1 to 6 percent, grace periods from 2 to 10 years, and maturities from 5 to 25 years.

8.4.3 Ethiopia

The government of Ethiopia has embarked on a determined dam building program to address the problems of power outages experienced in the country. In 2009 less than 10% of Ethiopians had access to electricity and the country was plagued by power outages.⁵⁶ The poverty in the country is quite high resulting in low demand for power, thus plans to export power to Sudan, Kenya, Yemen and Egypt. The dams are designed to provide water for irrigation and flood control but mainly for

⁵⁶ http://en.wikipedia.org/wiki/Dams_and_hydropower_in_Ethiopia

hydropower. Ethiopia has a high hydropower potential. Hydropower is nearly the only economical, feasible and reliable source of power supply in the country.

The power utility in Ethiopia is the Ethiopian Electric Power Corporation (EPCO). The utility is doing well in terms of collecting revenues, however the problem encountered is that the power tariffs are extremely low and this under-pricing only recovers 46% of the costs of the utility. In order for the utility to recover its costs and to function properly the tariffs would need to be increased.

The source of financing for hydropower in Ethiopia ranges from government grants, loans from capital markets, ODAs, financial institution loans and private funding.⁵⁷

8.4.4 Kenya

The Water Services Regulatory Board (WASREB), who regulates and monitors the urban and rural water service provision, is the most independent water institution in Kenya and generates approximately 72% of its funds internally. The Water Services Trust Fund (WSTF), established to provide financial assistance towards capital investment costs in areas lacking adequate services, has very limited self-generated funds and is approximately 67% financed by government and the rest by donor agencies. The water services boards generate a small percentage of the financing as most of their funds are from donor agencies or government.

Kenya has a well-developed microfinance sub-sector which has shown interest in the water sector. Kenya has undertaken a pilot project which uses an output based aid (OBA) approach to leverage co-financing from a private commercial micro-finance bank (K-Rep Bank Ltd). This project is supported by financial assistance from the Public Private Infrastructure Advisory Facility (PPIAF) and Global Partnership for Output-based Aid (GPOBA). The aim of the project is to minimize the need for grant finance in the development of infrastructure.

8.4.5 Zambia

The government of Zambia has established a Devolution Trust Fund to provide financing to water utilities based on proposals received from them as well as to water kiosks. The main financing in Zambia is however from donors and NGO's. The African Development Bank supports the seven local authorities' infrastructure rehabilitation projects. The Danish International Development Agency (DANIDA) assists Zambia with water supply and sanitation projects in rural and peri-urban areas as well as IWRM in Zambia. The German government-owned development bank, KfW, provides aid to Zambia via the Devolution Trust Fund (DTF) to the urban poor through water kiosks as well as providing aid for the construction of boreholes and hand-dug wells in the rural areas. Zambia also obtains financing from Ireland grants, the Japanese government agency, Japan International Cooperation Agency (JICA), grants for groundwater development and capacity building for utilities, UNICEF support of water supply projects and the World Bank.

8.4.6 Lessons learnt

Mitigating regulatory risk related to changes in exchange rates has proven to improve access to foreign financing for projects that are subject to regulation. Mitigating involves protecting projects against interference by regulatory agencies that would prevent tariff adjustments (as a result of

⁵⁷ Baodong, H, Perspectives on Financing & Delivering Hydropower Schemes in Ethiopia

matching cost increases caused by exchange rate movements). For example the partial risk guarantee against regulatory default that the World Bank granted for the concession of Uganda's electricity distribution company played a key role in attracting private investors.⁵⁸

8.5 India

In India, water supply is a municipal function implemented by Urban Local Bodies (ULBs). ULBs are the constitutionally provided administrative units that provide basic infrastructure and services in cities and towns. The majority of urban infrastructure projects undertaken by ULBs depend on government funds and semi-public financial institutions that lend to ULBs relying on state government guarantees. These funds have however been decreasing and the Reserve Bank of India has been attempting to discipline lending against state guarantees. This has limited the flow of funds to ULBs for infrastructure projects and forced them to explore alternative sources of financing. Some of the innovative measures are PPPs and pooled financing.

The Credit Rating Information Services of India (CRISIL) and the Financial Institutions Reform and Expansion (FIRE-D) undertook a project to formulate credit ratings for ULBs. This project enabled easier access to municipal bonds without state guarantees. The Ministry of Urban Development (MOUD) launched an initiative for the institutional credit rating of 47 ULBs by the Security and Exchange Board of India certified agencies. This initiative resulted in improved financial management of ULBs and attracted the public sector to finance urban infrastructure projects. However, small and medium ULBs found it difficult to access the capital markets based just on their balance sheet positions. Therefore, in 2006, MOUD formulated the Pooled Finance Development Fund Guidelines to help these ULBs access market funds for their infrastructure projects.

In the 1990's India undertook a few PPP initiatives but they were not successful due to the lack of political support and unaffordable tariff setting. In the early 2000s, the private sector started getting involved in setting up Water Treatment Plants (WTP) and Sewerage Treatment Plants (STP) and not just investing in basic water utilities. In recent years, PPP's have again become popular in the cities of India.

In Tamil Nadu, the Tamil Nadu Urban Development Fund (TNUDF) was set up as a PPP in order to provide sustainable financing for infrastructure investment. This fund was mainly used for municipalities with large and predictable revenue streams. The small ULBs had difficulty in accessing the capital markets due to the large transaction costs. TNUDF and the government of Tamil Nadu instituted an SPV called the Water and Sanitation Pooled Fund (WSPF). The Trust vehicle allowed the smaller municipalities to participate in the capital market and enabled private sector financing of infrastructure investments. A bond was issued by pooling 14 municipalities for water and sewerage infrastructure projects. This was the first municipal pooled issue. It had a fifteen-year maturity and an annual interest rate of 9.20%. The bonds were unsecured but a multi-layered credit enhancement mechanism was set up. The ULBs agreed to set apart monthly payments equal to one-ninth of their annual payments into escrow accounts and transfer the same during the tenth month into the

⁵⁸ Financing Infrastructure in Africa, How the region can attract more project finance, Gridlines, Note No.13, Sept 2006

WSPF's escrow account. USAID provided a backup guarantee of 50% of the bond's principal through the Development Credit Authority mechanism.⁵⁹

In Bangalore, the state government recruited FIRE-D to develop a market-based financing framework for Greater Bangalore Water and Sanitation Project (GBWASP). FIRE – D designed an innovative model of 'pooled finance' in which capital for the project was to be collected through beneficiary capital contributions (BCC), state loans, grants and debt raised through municipal bonds. A debt fund called the Karnataka Water and Sanitation Pooled Fund (KWSPF) was established under the Indian Trust Act to access the capital market by issuing a bond on behalf of the participating ULBs.

Other forms of obtaining finance in India include Design, Build, Own, Operate and Transfer (DBOOT) contracts in Chennai as well as concession agreements in Tirupur Town. Many utilities are taking small steps and handing out service and management contracts and undertaking pilot projects in small demo areas instead of awarding long-term concessions.

⁵⁹ Urban Water Sector Reforms in India: Financing Infrastructure Development through Market – based Financing and Private – Public Partnerships, Sonia Ferdous Hoque, 10 February 2012