REPUBLIC OF MOZAMBIQUE

WASHCost Mozambique

ASSESSMENT OF THE WATER AND SANITATION

Sector of Mozambique

FINAL REPORT

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List of Abbreviations

	Portuguese	English
AdM	Aguas de Moçambique	Mozambique Water Supply
AfDB	Banco Africano de Desenvolvimento	African Development Bank
ARA	Administração Regional de Águas	Regional Water Authority
ASAS	Apoio Sectorial ao Sector de Águas	Sectoral Support to the Water Sector
ASNANI	Projecto Integrado de Abastecimento de Água e Saneamento para Nampula e Niassa	Integrated Water Supply and Sanitation Project for Nampula and Niassa
AT	Tribunal Administrativo	Administrative Tribunal
BM	Banco de Moçambique	Bank of Mozambique
CapEX	Investimentos de capital em actives fixos	Capital investments in fixed assets
CapManEX	Depesas de capital de manutenção	Capital maintenance expenditure
CBO	Organização de Base Comunitária	Community-Based Organization
CEDESA	Centro de Estudos de Desenvolvimento do Sector de Águas	Strategic Study Centre for the Water Sector
CFPAS	Centro de Formação de Água e Saneamento	Training Centre for Water and Sanitation
CIDA	Agência Canadiana de Desenvolvimento Internacional	Canadian International Development Agency
CRA	Conselho de Regulação do Abastecimento de Água	Water Regulatory Board
CUT	Conta Única do Tesouro	Treasure Single Account
DAF	Departamento de Administração e Finanças	Department of Administration and Finance
DAR	Departamento de Água Rural	Rural Water Department
DAS	Departamento de Água e Saneamento	Water and Sanitation Department
DES	Departamento de Saneamento	Sanitation Department
DNA	Direcção Nacional de Águas	National Directorate of Water
DNT	Direcção Nacional do Tesouro	National Directorate of the Treasury
DPFP	Programa de Planificação e Finanças Descentralizadas	Decentralization of Planning and Finance Program
DPOPH	Direcção Provincial de Obras Públicas e Habitação	Provincial Directorate of Public Works and Housing
DRA	Enfoque Centrado na Procura	Demand-Responsive Approach
DRH	Departamento de Recursos Humanos	Department of Human Resources
EPAR	Estaleiros Provinciais de Água Rural	Provincial state companies for rural water supply
FCGD	Fórum Coordenador da Gestão Delegada	Delegated Management Framework
FIPAG	Fundo de Investimento e Património do Abastecimento de Agua	Investment and Assets Fund for Water Supply
FRELIMO	Frente de Libertação de Moçambique	Mozambican Liberation Front
GBS	Apoio Geral ao Orçamento	General Budget Support
GOM	Governo de Moçambique	Government of Mozambique
GON	Governo do Reino dos Países Baixos	Government of The Netherlands
GPC	Gabinete de Plannificação e Controle.	Division of Planning and Control
IAF	Inquérito aos Agregados Familiares	National Household Budget Survey
IWRM	Gestão Integrada dos Recursos Hídricos	Integrated Water Resources Management
JMP	Programa de Monitorização Conjunta	Joint Monitoring Programme
LOLE	Lei dos Órgãos Locais do Estado	Law of Local State Authorities
MAE	Ministério da Administração Estatal	Ministry of State Administration
MCC	Corporação do Desafio do Milénio	Millennium Challenge Corporation
MDG	Objectivos de Desenvolvimento do Milénio	Millennium Development Goal
MEC	Ministério da Educação e Cultura	Ministry of Education and Culture
MINAG	Ministério da Agricultura	Ministry of Agriculture
MIPAAR	Manual de Implementação dos Projectos de Abastecimento de Água Rural	Manual for Implementation of Rural Water Projects
MISAU	Ministério da Saúde	Ministry of Health
MOPH	Ministério das Obras Públicas e Habitação	Ministry of Public Works and Housing
MPD	Ministério da Planificação e Desenvolvimento	Ministry of Planning and Development
MFEF	Cenário Fiscal de Médio Prazo	Medium Term Expenditure Framework

	Portuguese	English
MFEP	Plano Fiscal de Médio Prazo	Medium Term Expenditure Plan
MOF	Ministério das Finanças	Ministry of Finance
NCA	Conselho Nacional de Água	National Water Council
NRWSSP	Programa Nacional de Abastecimento de Água e Saneamento Rural	National Rural Water Supply and Sanitation Program
NWDP	Programa Nacional de Desenvolvimento de Águas	National Water Development Programme
NWP	Política Nacional de Águas	National Water Policy
NWSSP	Programa Nacional de Abastecimento de Água e Saneamento	National Water Supply and Sanitation
OE	Orçamento do Estado	State Budget
OPEX	Pequenas despesas de funcionamento e de Manutenção	Operating and minor maintenance expenditures
PAF	Quadro de Avaliação do Desempenho	Performance Assessment Framework
PAP	Parceiros de Ajuda ao Programa	Programme Aid Partners
PARPA	Plano de Acção para a Redução da Pobreza Absoluta	Plan for the Reduction of Absolute Poverty
PDO	Plano de Desenvolvimento Distrital	District Development Plan
PEM	Gestão da Despesa Pública	Public Expenditure Management
PES	Plano Económico e Social	Sector Annual Socio-Economic Plan
PFM	Gestão das Finanças Públicas	Public Finance Management
PPP	Parceria Público Privada	Public Private Partnership
PRSC	Crédito de Apoio à Redução da Pobreza	Poverty Reduction Support Credit
RENAMO	Resistência Nacional de Moçambique	Mozambican National Resistance
RNE	Embaixada do Reino dos Países Baixos	Royal Netherlands Embassy
RWSSP	Programa de Abastecimento e Água e Saneamento Rural	Rural Water Supply and Sanitation Program
SBS	Apoio ao Orçamento Sectorial	Sector Budget Support
SDMAS	Serviços Distritais da Mulher e da Acção Social	District Services of Women and Social Affairs
SDPI	Serviços Distritais de Planificação e Infra-estruturas	District Services of Planning and Infrastructures
SINAS	Sistema Nacional de Informação em Água e Saneamento	National Water and Sanitation Information System
SISTAFE	Sistema de Administração Financeira do Estado	State Financial Administration System
SWAp	Abordagem Sectorial Programática	Sector-wide Approach
TA	Assistência Técnica	Technical Assistance
TOR	Termos de Referência	Terms of Reference
UNICEF	Organização das Nações Unidas para a Infância	United Nations Children's Fund
VLOM	Funcionamento e Manutenção ao Nível da Aldeia	Village Level Operation and Maintenance
WASH	Água, Saneamento e Higiene	Water, Sanitation and Hygiene
WASHCost	Projecto de Custos de Água, Saneamento e Higiene	Water, Sanitation and Hygiene Cost Project
WB	Banco Munidial	World Bank
WSS	Abastecimento de Água e Saneamento	Water Supply and Sanitation
ZAMWAT	Gestão Integrada dos Recursos Hídricos e do Abastecimento de Água Rural na Bacia do Rio Zambeze	Integrated Water Resources Management and Rural Water Supply in the Zambezi River Basin

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This report would not have been completed without the valuable assistance of many people and institutions that allowed us to use and shared information related to the Water and Sanitation in Mozambique. The WASHCost Water and Sanitation Assessment Team wishes to acknowledge the valuable support and assistance received from DNA, WASHCost Project team in Mozambique, staff members of DAS in Nampula, Inhambane and Sofala and a number of development partners in the preparation of the present Document. IRC in the Netherlands provided the leadership that enable the team to integrate lessons from across the world in the critical assessment of data and information provided.

Salomon, Lda and its sub-consultants from Austral-COWI look forward to continued close collaboration with DNA and the WASHCost project implementation team, development partners and other stakeholders in the studies, research and trial initiatives that will facilitate the establishment of sound cost information for provision of sustainable WASH services and goods.

EXECUTIVE SUMMARY

Provision of potable and reliable water supply as well as adequate sanitation are critical elements of infrastructure expansion and poverty alleviation in Mozambique, particularly in rural areas where around 70% of the population resides under extreme poverty.

Since independence, the country has carried out several initiatives, in different forms, to address the limitations in rural water supply and sanitation subsector but the levels of coverage are still far from desirable. A series of factors have interfered negatively in the expansion of rural water and sanitation facilities and services, which is in dire contradiction with the central position of this subsector in achieving sustainable development in line with all the internationally agreed development goals, including the MDGs.

Lack of accurate data, especially in rural and peri-urban areas, makes it impossible to estimate the true cost of extending sustainable and good quality water, sanitation and hygiene services to the poor. Among other aspects, lack of transparency can be an open door to corruption and can obstruct comparisons of efficiency and value for money. It is believed that reversing these aspects will lend important elements to the process of building a sound rural water supply and sanitation system in which several actors are active.

The International Water and Sanitation Centre (IRC) in the Netherlands is implementing a program aiming at “QUANTIFYING THE COST OF DELIVERING SAFE WATER, SANITATION AND HYGIENE SERVICES” (WASHCost). WASHCost Project is designed as a five-year action research project to build Learning Alliances with key stakeholders in four partner countries to identify the real and disaggregated costs of water, sanitation and hygiene (WASH) services in rural and peri-urban areas, and the range of physical, social, economic and political factors that influence those costs.

This report is the first product of a series of studies and exercises that, in the course of the next five years, will be deciphering the actual costs of sustainable WASH services to the poor, and assist the global community to meet the MDGs sustainably

The report presents a comprehensive subsector analysis from its institutional, policy and regulatory perspective as well as a brief discussion of technological options and

makes an initial description and assessment of costs related to the provision of sustainable WASH services. Information provided by different players in the sector and extensive review of secondary data and reports gathered from several sources, including findings from visits to two provinces (Sofala and Nampula) were the main methodologies used to compile this report.

The most important legal and regulatory provisions informing water and sanitation services in Mozambique are divided into two major categories, namely national and international.

At the **international level** the main provisions are: (i) **United Nations Millennium Development Goals** (2000), which in Mozambique have been translated into the goal of achieving rural water coverage to 70% and rural sanitation coverage to 50%, by 2015; (ii) **Rome Agreement on Harmonization** (2003), which is relevant given the commitment to all interested parties to align their contribution to RWSS to country-led Sector-Wide Approaches (SWAPs); (iii) **Paris Declaration on Aid Effectiveness** (2005); and **Accra Agenda for Action** (2008), that also insist on the need for the alignment of international aid by responding to long-term country priorities and in-country systems to avoid parallel implementation structures; and (iv) **World Health Organization** (WHO) and **UNICEF** (United Nations Children's Fund), who have formed the **Joint Monitoring Programme for Water Supply and Sanitation** (JMP), to conduct regular assessments and evaluations of water supply and sanitation worldwide using information available from a diversity of sources.

At the **national level** the most important provisions are: (i) The **National Constitution**, in terms of defining the way in which the country is organized and the importance of public health and involvement of all in the pursuit of adequate health and sanitation; (ii) **Water Law and National Water Policy** that define important principles in water supply and sanitation such as that these services should be provided in accordance with the demand and economic capacity of the users, that tariffs should permit the recovery of operational and maintenance costs, and later contribute to investment and sustainability of the systems; and that in as far as possible water supply and sanitation services should be decentralized to autonomous local agencies; (iii) **PARPA II** (Absolute Poverty Alleviation Action Plan) and the **Government Five Year Plan** (2005-2009). The Government of Mozambique (GoM)'s action plan for poverty reduction in the past decade - PARPA I (2001-2005) and PARPA II (2006-2009) are based on the

premise that broad based economic growth is critical to poverty reduction. PARPA II highlights that investing in water and sanitation services contributes to meeting not only the short-term objectives of the MDGs, but also Mozambique's long-term growth and poverty reduction plans; (iv) The **Rural Water Supply and Sanitation Strategy and Program** that translates PARPA and the GoM's Five Year Plan into specific objectives, targets and activities for the RWSS subsector.

Other laws and regulations relevant to Rural Water and Sanitation, include: (i) Planning and Financial Instruments, i.e. the Economic and Social Plan/State Budget, which translates PARPA and the Government Five Year Plan into specific annual plans of activities (PES) and respective resource allocation (OE); (ii) Management Instruments, mainly SISTAFE (Public Financial Administration System) aimed at regulating public finances by integrating its five subsystems: State Budget, Public Accounts, Treasure, State Patrimony and Internal Control; (iii) Procurement: Decree 54/2005 which introduces greater transparency into public procurement of goods and services by making it mandatory to advertise and to publicly open bids and announce bid results; (iv) Decentralization policies in general translated into a series of decrees aimed at decentralizing, deconcentrating and devolving power to and strengthening local entities, mainly the districts and the entities below the district such as administrative posts and localities.

RWSS programs, projects and interventions in general are financed by the Government of Mozambique supported by a number of development partners and involve a multitude of actors, mainly:

(i) The Government itself with its Ministry of Public Works and Housing (MOPH) and its four main technical areas of operation, including water (DNA), which in its turn includes a department for rural water supply (DAR) and another department for sanitation (DES), at the central level. At provincial level MOPH is represented by DPOPH, with its department for water and sanitation (DAS). At district level, by the District Services of Planning and Infrastructure and Health, Women and Social Affairs Services. Beyond the district, the government's water and sanitation sector is not directly represented;

(ii) Donors: The most important donors in the water and sanitation sector are the Netherlands, DFID, UNICEF, AfDB, MCC, CIDA, Irish Aid, SDC, EU, Water Aid, CARE and the World Bank. In 2006, AfDB and the WB provided 40% and

35% of the total aid support to the water sector, respectively;

(iii) NGOs/CBOs, which complement government and donor interventions in rural water supply and sanitation by designing and implementing their own projects and programs and by being subcontracted by the government and/or the donors to implement programs and projects on their behalf;

(iv) Beneficiaries, estimated to represent around 14.1 people living in rural areas (INE, 2005). In general, beneficiaries are organized in Water and Sanitation Committees, which focus mainly on water supply and have limited intervention on sanitation. They interact with the water and sanitation development entities and organize consumers to use water sources appropriately and to participate in operation and maintenance;

(v) The private sector is responsible for providing goods and services to the subsector. It is concentrated in Maputo and the provincial capitals in the form of contractors (drilling, construction, etc.), consultants (studies, works supervision, facilitation, etc.), and suppliers (water, equipment, parts, consumables, etc.). So far, the scale of procurement of goods and services in rural water supply and sanitation is not conducive to the proliferation of business operators in the subsector and less so to their establishment below the provincial level.

Since the end of the civil war in 1992, rural water supply and sanitation is planned, implemented, monitored, evaluated and reported as part of an overall government reform process. This was then formalized in 2001. The main objectives of the public sector reform (2001-2011) are to: 1) make the sector more effective and efficient, 2) ensure the creation of an enabling environment for the private sector, 3) curb corruption, 4) deliver goods and services to the population at large with a particular emphasis on the poor, thus contributing to the reduction of poverty and therefore the attainment of PARPA objectives.

And after many years of focusing on a project approach whereby, based on their inclination, each agency would take responsibility for specific areas of the sector/sub-sector in specific regions of the country on a project by project basis, the subsector is now shifting to embrace a sector wide approach (SWAP) to water supply and sanitation, including its rural subsector. To that effect the National Rural Water Supply and Sanitation Program (NRWSSP) for the period 2009-2015 has been formulated and is in the process of preparation to start its pilot year in 2009. It is envisaged that there

will be a Common Fund for the subsector which is expected to be used as a means of gaining the experience necessary for making informed decisions regarding transition to budget support in the sub-sector, in the years to come.

The cost of water and sanitation is a sum of several cost categories, mainly (i) Capital investments in fixed assets (CapEX); (ii) Operating and minor maintenance expenditures (OPEX); (iii) Capital maintenance expenditure (CAPManEX); (iv) Support costs (direct and indirect); (v) Cost of capital (WASHCost, 2008). To these other costs such as time spent to access the goods and services due to distance, competition between the various basic needs at the household and family level (food, health, education, etc.), and other obstacles that may force people to be prevented and/or prevent themselves from having and/or facilitating access to those goods and services, can be added.

Under the existing planning, budgeting and budget execution and reporting systems and mechanisms most of the costs are aggregated and as such are of limited use for decision making processes.

Delivering value for money by efficient and effective use of resources requires that all cost categories and sub categories be known and applied to meet the pro poor water and sanitation in the implementation of strategic priorities. This requires cognisance of (i) implementation structure of each program; (ii) range of technological options that are available and can be used in a specific setting; (iii) socio-economic environment; (iv) market size or work continuity; (v) specifications in use; (vi) environmental settings or hydro geological settings.

DNA/DAR/DES is in the process of developing standardized designs of water supply and sanitation infrastructures. At present most of these standards do not differentiate between different geological conditions.

The concept of standardization is based on compromise. Its positive aspects are related to objectives such as lowering costs, facilitating quality control, improving implementation rates, and facilitating private sector involvement. Typical negative aspects include aspects such as the design not always being the most appropriate for local conditions, not being conducive to technological development, limiting “client” involvement in design. In an environment of weak institutions for proper supervision and follow-up this serves the purpose of protecting the investment and reducing the

risk of poor construction works.

The existing financial planning, implementation, monitoring and reporting that characterize most of the role players in rural water and sanitation results in poor consistency of financial data. The country is still in an early stage of adopting a more consistent system of planning and budgeting as well as monitoring and reporting. The systems and procedures in the process of being improved aim at:

(a) **Maintaining fiscal discipline**: by keeping spending within limits created by the ability to raise revenue and keep debt within levels that are not prohibitively expensive to service.

(b) **Promote strategic priorities**: by allocating and spending resources in those areas that make the greatest contribution to the government's objectives.

(c) **Deliver value for money**: by efficient and effective use of resources in the implementation of strategic priorities.

The planning and budgeting that is being developed and the process covers the following main stages:

- **Policy review**: This consists mainly of an annual evaluation of the results of public planning and expenditure to inform the updating of policies and plans.
- **Strategic planning**: Based on PARPA and the Government's Five Year Plan this consists in setting expenditure and deficit targets, on the basis of macroeconomic projections and financial commitments made by the various budget actors, over 3 years (CFMP).
- **Budget preparation**: submission and negotiation of the ministries and other state institutions of expenditure bids within plan and budget guidelines and expenditure limits circulated by the MPD and the Ministry of Finance (MF).
- **Budget execution**: after the approval of the budget appropriations, the resources are released to the spending agencies (state organs (government departments, parliament, courts, etc.) public companies), to implement expenditure programmes. At present DAS and SDPI and SDMAS are not budget executing entities, which means that they do not receive funds to cover their expenses directly. This makes it difficult to track water and sanitation expenses at the provincial and district levels, where most of the interventions

take place.

- **Accounting and monitoring of expenditures and revenues**: tracking the composition and level of revenue and expenditure over the year and monitoring the outputs of expenditure. It is generally acknowledged that weak elements remain in the overall public expenditure management system in the country, and consequently, implementation often diverges noticeably from plans. In a situation where DAS and SDPI/SDMAS do not have direct budget execution responsibilities they tend to ignore the financial component in their monitoring systems.
- **Reporting and audit**: the Administrative Tribunal (TA) reviews compliance with the budget, reporting in detail to Parliament and initiates corrective actions as necessary.

Six principles are at the core of the process, namely: (i) political engagement and commitment to the budget; (ii) policy clarity, consistency and affordability; (iii) predictability; (iv) transparency; (v) comprehensiveness and integration; and (vi) accountability. These principles and their combination evoke harmonization and strengthening of planning and budgeting instruments and to a great extent they call for the pooling of funds from the various sources to finance unified strategies, plans and a budget steered by one single entity, in this case the government, assisted by other stakeholders. This has not been the case in the last few years.

The various actors follow different forms of planning and budgeting, monitoring and reporting, namely (i) donors that use a combination of funding mechanisms that range from fully non-aligned to fully aligned with the government procedures. A considerable number of big donors have been moving towards alignment and harmonization and increased adoption of budget support but there are still two-thirds of the country's aid that stays outside the system and is channelled directly to line ministries, provinces and districts as sector funds or under traditional project modalities; (ii) NGOs have been the most difficult to characterize in terms of their budget planning, including budget forecast for themselves and for other stakeholders; (iii) beneficiaries characterized by unreliable and difficult to characterize systems to make financial contributions and keep adequate records; (iv) the private sector is marked by several types of variations that range from technologies used to cost structures informed by regional discrepancies in a somewhat unregulated environment.

The National Rural Water Supply and Sanitation Program (NRWSSP) for the period 2009-2015 offers a series of opportunities and challenges for a better structured WASHCost analysis. The program is divided into two phases where the first Phase (2009-2011) is estimated to absorb USD 196.7 million coming from four main sources. There is still a funding gap of USD 26.8 million (14%) which is expected to be a subject of negotiation between the Government and its current and potential development partners.

Under the NRWSSP the five main actors (government, donors, NGO/CBO, private sector and the beneficiaries) are expected to work together in order to achieve:

a) far-reaching capacity building to support decentralized planning, management and monitoring of RWSS facilities;

b) promoting and supporting common planning, reporting and monitoring systems; and

c) promoting the increased use of national planning, budgeting, financial management, procurement and monitoring systems in the sub-sector.

WASHCost will be supporting the accomplishment of the various RWSSP targets, systems and procedures and will try to derive maximum benefit from the planned developments, which if materialized, will constitute a great opportunity for meeting the RWSS strategic objectives and particularly the pro poor and “value for money” approaches to the provision of RWSS related goods and services.

However, there seems to be enough evidence to the effect that a significant number of the planned developments will require more time to reach the desirable level of stability and maturity that will go beyond the lifespan of the WASHCost Project. This would recommend that WASHCost project considers a few alternative ways of fostering its objectives at the same time that it supports and uses the developments that will be coming out as the RWSS Program evolves. Separate studies, such as a comprehensive Rural Water Sector Expenditure Review and other, should be conducted by WASHCost Project and where relevant these would feed into the various pro poor and “value for money” measures considered under RWSS Program.

In order to overcome existing capacity weaknesses RWSS Program foresees a combination of training modalities ranging from: formal training; non-formal training; and informal training.

It is recommended that WASHCost Project espouses and supports these capacity building plans and activities but it is also suggested that the project should develop a few parallel lines of action to meet its specific objectives at the same time that it insists on the adoption of a few more practical elements to capacity building than what seems to be covered under the existing program. Focus would be on the production and making available "user friendly" tools (forms, templates, etc.) for planning, budgeting, monitoring and reporting and tutoring the various actors to be integral part of better cost analysis systems and procedures. These include measures such as:

(a) Conducting a water and sanitation sector expenditure analysis including the analysis of its rural subsector. This would assist in establishing a solid baseline to be used throughout the WASHCost Project and RWSSP lifespan to monitor and evaluate progress;

(b) Making available forms and templates for the personnel at the DNA/DAR/DES, DAS, SDPI, SDMAS to conduct planning, budgeting, monitoring and reporting of their activities. This would be aimed at providing a number of standard forms and templates to carry out these tasks and consequently to make it easier to harmonize information at the various levels.;

(c) Provide community book keepers with easy to use forms to record monetary contributions and other contributions from community members.;

(d) Provide local artisans and other goods and service providers with simple forms to record and report on the links between their work and financial transactions, etc.

In summary in addition to recommending a close collaboration between WASHCost and NWSSP it is also recommended that the two sides find creative ways of complementing each other and avoid duplication in areas of common interest, particularly cost disaggregation

The GPC initiative National Water and Sanitation Information System (SINAS) provides a concrete venue to embedding some of the WASHCost project initiatives and actions foreseen in the coming years.

Based on the review presented in this documents the team has devised key aspects to be taken into consideration during the development of the research protocol that will

guide the future work of WASHCost project in the coming 5 years. The following suggestions are very preliminary and should be further detailed in specific project research protocols.

1. Collection and analysis of CAPex data is relatively ease, therefore the project should initially focus on collecting and analysing these costs;
2. Cost analyses of rural water supply needs to focus initially on the main technologies. These are: Mechanically drilled borehole equipped with Afridev and hand dug wells. Other technologies such as springs, rain water harvesting, very deep wells are relatively marginal in the country and have little impact in strategic budgeting and long term expenditure planning.
3. There is need to arrive at a consensual definition of Peri-urban in order to start the work of collecting and analysing pertinent data at this important level.
4. Cost analyses for sanitation could initially concentrate on slab latrines, and to a lesser margin, VIP latrines
5. The problematic issues related to the cost of hygiene can best be tackled by disaggregation of PEC costs and activities. However, this will not answer the issue in full since some of the activities are carried out in the health sector and not directly linked to water supply provision.
6. Knowledge of Support Cost (direct and indirect) requires a lot of work for example to detail government expenditure (salary, per diems, communication). This requires development of better planning, budgeting and reporting tools that should be analysis based on the existing framework guiding the operations at various levels including the interdependences between departments. Initial information on Support Cost in probable available at program level e.g. ASNANI and UNICEF.
7. Collect data on the usage and fee collection methods, rates of water vendors and public tap stands in order to help develop national or provincial procedures to deal with this component of water supply in peri-urban areas.

The research protocols to be developed for data collection and analysis for different components can include the methods identified in the table below:

Terminology	Recommended best source and methods
Capital investments in fixed assets (CapEX)	Existing literature of proposals and evaluations at Provincial and national level and NGOs, request quotations and price lists. This costs can also be obtained from running programs
Operating and minor maintenance expenditures (OPEX)	Existing Community books, PSAA operators, provincial evaluations. Interviews with Water committees, spare part vendors or Pilot Studies.
Capital maintenance expenditure (CAPManEX)	Identify units and request quotations and price list. Verify existing rehabilitation plans at national and regional levels of PSAA. Extensive survey at different department of bid documents. The study could also select few departments and follow-up closely the different stages of the process of procuring and implementing projects for service provision.
Support costs (direct and indirect)	Interviews with district, provincial and national government agencies. Ideally, sector expenditure study. Develop and monitor implementation of data collection tools including tutoring.
Cost of capital	Interview with private operators, private sectors, banks and finance institutions. Review the BoQ and the invoices approved for payment against field technical reports.

1 INTRODUCTION

1.1 BACKGROUND

Access to clean water and adequate sanitation significantly affects overall well-being of people through its impact on health, education, gender equality, and productivity. Provision of potable and reliable water supply is a critical element of infrastructure expansion in Mozambique. The long tradition of individual or household based sanitation infrastructure is also a challenge that needs to be addressed in an innovative way in order for developing countries to expand access to services. Mozambique is largely a rural country with 70% of its population residing in rural areas, often in scattered homesteads.

The overall situation at independence, from colonial rule in 1975, was appalling with high illiteracy rate, extremely low coverage by both water supply and sanitation and high gender inequalities.

Over the years several initiatives have taken place in different forms to address the limitations encountered in the water and sanitation sector. The path to social and economic progress was disturbed by the civil war during the 1980s, with significant setbacks in education, health and basic infrastructure. In 1984 the International Monetary Fund and the World Bank (WB) recommended an Economic Recovery Program based on the market and private sector participation which was adopted in 1986. The civil war ended in 1992 following the signing of a peace agreement between the Government and the rebel movement.

In 1990 Mozambique changed its Constitution for the first time after independence to engage in a multiparty democratic system. General elections have successfully been carried out, regularly every five years since 1994. In 1998, the country launched the decentralization process, aiming to have local governing bodies elected. In the first stage 33 cities and villages where selected to pioneer the process that after evaluation would be expanded to new areas. However, in 2003 when the process was repeated, it was decided to consolidate the process and correct the serious constraints that the system was faced with. For the new elections planned for 2008 the Mozambican parliament has added 10 new cities and villages to the group of municipalities that will elect their governing bodies.

The United Nations Commission on Sustainable Development (CSD) notes that

"*investments in water, sanitation and human settlements contribute to economic growth, sustainable development, better health and reduced poverty*"[1]. The achievement of water, sanitation and human settlements goals, is critical to the implementation of the three pillars of sustainable development and the achievement of all the internationally agreed development goals. Thus increasing attention is paid to the role of water, sanitation and hygiene (WASH) services in addressing poverty.

Lack of accurate data, especially in rural and peri-urban areas, makes it impossible to estimate the true cost of extending sustainable and good quality water and sanitation services to the poor. Moreover, lack of transparency shields corruption and obstructs comparisons of efficiency and value for money (IRC – Study ToRs[2]).

The International Water and Sanitation Centre (IRC) in the Netherlands is implementing a program aiming at "QUANTIFYING THE COST OF DELIVERING SAFE WATER, SANITATION AND HYGIENE SERVICES" (WASHCost). WASHCost is designed as a five-year action research project to build Learning Alliances with key stakeholders in four partner countries.

The current report is a building stone of a 5 year program aiming at deciphering the inherent costs of providing sustainable WASH to the poor, and at assisting the global community to fast track the MDGs. Overall, the project aims to identify the real and disaggregated costs of water, sanitation and hygiene (WASH) services in rural and peri-urban areas, and the range of physical, social, economic and political factors that influence those costs.

The WASHCost Project researches the life-cycle costs of water, sanitation and hygiene (WASH) services in rural and peri-urban areas in four countries, namely Mozambique, India (Andra Pradesh), Ghana and Burkina Faso. The rationale is that WASH governance will be improved at all levels, as decision makers and stakeholders analyse the costs of sustainable, equitable and efficient services and put their knowledge to use.

The history of WASH funding in Mozambique is a mixture of different players, institutional arrangements and responsibility shifts, policy and focus changes that

[1] Commission on Sustainable Development, Thirteenth Session DECISION ADOPTED BY THE COMMISSION, 22nd April 2005

[2] IRC, 2008 - WASHCost Mozambique - "Assessment of the Water and Sanitation Sector in Mozambique" - Terms of Reference

exacerbate the complications of tracking the historic costs associated with sector development. Government programs and NGO's funded initiatives at different times dominated the scene in Mozambique. Both Government and NGO's have shortcomings in relation to good accountability and availability of secondary and primary solid cost data.

Recently the international community concluded that channeling bilateral and multilateral resources through international NGOs shifts accountability and responsibility away from national and local leaders, undermining local capacity and creating further emergency assistance[3].

Developing countries receiving aid are now reformulating their policies and restructuring institutions in order to create conditions for ample action coordination of activities in WASH service delivery and sustainability. The most advocated strategy is the Sector Wide Approach with programmatic initiatives that look at the infrastructure life-cycle rather than focusing in achieving a specific number of new infrastructure projects. In order to be successful it is now required to identify all key elements related to the operation of the sector including these related to construction and maintenance of infrastructure.

1.2 STUDY OBJECTIVE

This study intends to provide the WASHCost project with a comprehensive base of information that is required to develop the more detailed research methodologies and systems for the implementation of the five year project.

The current study objective is to present a complete sector analysis of institutions, laws, policies and costs related to the provision of sustainable WASH services in Mozambique. The study is largely based on information provided by different players in the sector and an extensive review of existing data and reports gathered from several sources. Field visits to two provinces (Sofala and Nampula) allowed a comprehensive assessment of the *status quo* and identification of challenges and opportunities associated with current policy shifts and decentralization processes.

[3] *Ian Smillie(ed) 2001:* **PATRONAGE OR PARTNERSHIP Local Capacity Building in Humanitarian Crises** *(for the Humanitarianism and War Project)* Kumarian Press/IDRC 2001 ISBN 978-1-56549-129-8 e-ISBN 1-55250-211-2, 224 pp.

2 INSTITUTIONAL AND HISTORICAL CONTEXT

2.1 LEGAL AND REGULATORY FRAMEWORK FOR RURAL WATER SUPPLY AND SANITATION IN MOZAMBIQUE

Rural Water Supply and Sanitation is part of the overall national strategy aimed at expanding the access of people to these two fundamental goods and services. The most important legal and regulatory provisions informing water and sanitation services in Mozambique are:

A. At the International Level

- **United Nations Millennium Development Goals (2000)**

Of particular importance is MDG Target 7 which calls for halving, by 2015, the percentage of the population which in 1990 lacked access to potable water and adequate sanitation. The Mozambican Government has committed to increase rural water coverage to 70% and rural sanitation coverage to 50%, by 2015.

- **Rome Agreement on Harmonization (2003)**

The above-mentioned agreement called its signatories and other interested parties to provide aid in a way that is aligned to country-led Sector-Wide Approaches to Programming (SWAPs) and also stresses that aid should be aimed at strengthening the sector effectiveness and dissemination of good practices.

- **Paris Declaration on Aid Effectiveness (2005)**

The Paris Declaration called for the alignment of international aid by responding to long-term country priorities and in-country systems to avoid parallel implementation structures. It advocated for the creation of common funds by donors to be managed by the country authorities.

- **Accra Agenda for Action (2008)**

The Accra meeting took place in 2008[4] with the aim of reviewing the implementation of the Paris Declaration. It reaffirmed the recipients' "country ownership" as well as "accountability and transparency". Donors are expected to strengthen the recipients' capacity to manage aid and to use the recipients' personnel and government systems;

[4] The results of this meeting are not well known yet.

play a supportive role and not fly in their own experts. It also advocates the need for donors to avoid project funding, but go for program based funding with the 50% of government-to-government assistance through treasury channels, avoiding fragmentation.

- **World Health Organization (WHO)**

The WHO works on various aspects of water, sanitation and hygiene targeting mainly areas where the health burden is high, where interventions could make a major difference and where the present state of knowledge is poor. It focuses on and assists national governments in policy development, research, capacity building, partnerships, norms and standards, and tools and guidelines. WHO collaborates with other UN relevant agencies, mainly with UNICEF (United Nations Children's Fund). WHO and UNICEF have formed what is known as the Joint Monitoring Programme for Water Supply and Sanitation (JMP), which conducts regular assessments and evaluations of water supply and sanitation worldwide using information available from a diversity of sources. WHO and UNICEF interventions advocate and highlight the fact that in addition to being basic human rights, access to safe water and to sanitary means of excreta disposal are universal needs as well as essential elements of human development and poverty alleviation and constitute an indispensable component of primary health care.

B. At the National Level

- **The National Constitution**

The country forms a unitary state at the same time that it is divided into provinces, districts, administrative posts, localities and villages. Urban areas comprise cities and towns (Art. 7, points 1 and 2). All the citizens are entitled to medical and sanitary assistance as well as to protect public health (Article 89, on health).

- **Water Law, National Water Policy**

National Water Law 1991[5] and the National Water Policy from 1995[6], which was updated in 2007: These two legal provisions stipulate that: (i) water supply and sanitation services should be provided in accordance with the demand and economic capacity of the users; (ii) tariffs should permit the recovery of operational and maintenance costs, and later contribute to investment and sustainability of the systems;

[5] Lei nº. 16/91 de 3 de Agosto, Boletim da Repúblca nº. 31, 1a Série de 3 de Agosto de 1991, 2º Suplemento.
[6] Politica Nacional de Águas, Resolução n.º 7/95 de Agosto, Boletim da República nº. 34, 1 a Série de 23 de Agosto de 1995.

and (iii) in as far as possible water supply and sanitation services should be decentralized to autonomous local agencies. The revised Water Policy (2007)[7] highlights the role of rural water supply and sanitation in meeting basic needs, the need for universal access to minimum services as well as the long term sustainability of these services.

In this regard the policy stresses that rural water and sanitation should: (a) give priority to provinces and districts with lower coverage in order to reduce regional asymmetries; (b) promote the demand led principle as a way of assuring community involvement and sustainability of the systems; (c) continuation of deconcentration and decentralization; (d) the contribution of beneficiaries in construction and rehabilitation as well as in operation and maintenance; (e) organization and involvement of beneficiaries in planning, management and maintenance of the systems as well as education for hygiene focusing on women; (f) management, operation and maintenance of the systems by autonomous or private institutions; (g) the involvement of the private sector in all stages of service provision; (h) provision of hand pumps and spare parts with the involvement of local initiatives; (i) research and use of alternative low cost technologies, and (j) organization and updating of an infrastructure database.

Water reforms have made progress but gaps remain. The results of the 1995 National Water Policy and subsequent sector reform in Mozambique are positive. The sector has made significant progress, both institutionally and on the ground, especially in the larger cities with the policy of delegated management coupled with a robust regulatory framework. The institutions created to operate in the Urban areas (FIPAG and CRA) are functioning well and achieving results according to their mandate. For the rural areas, characterized by small piped village systems and point source (boreholes with hand pumps), a demand driven community managed model was developed in the early 2000s and piloted in a number of communities. The pilots have been successful but, as over 70 percent of the population lives in rural areas, the challenge remains enormous. A neglected area of sector strategy has been addressing the needs of smaller cities and towns that can be considered as resembling the peri-urban environment in Mozambique.

Sanitation in particular focuses on (i) increasing coverage in a way that is consistent with the MDG; (ii) in the long term increase coverage in order to bring it closer to

[7] Resolução 46/2007 do Conselho de Ministros de 200/10/30 BR Nº.43 – 5.º Suplemento – I Série

universal coverage; (iii) in the medium term ensure that communities served by a reliable water supply source have adequate sanitation infrastructure in their homes; and (iv) ensure the adoption of adequate hygiene practices at the household, community and school level.

- **PARPA II (Absolute Poverty Alleviation Action Plan)**

The Government of Mozambique (GoM)'s action plan for poverty reduction in the past decade - PARPA I (2001-2005) and PARPA II (2006-2009) are based on the premise that broad based economic growth is critical to poverty reduction. Under PARPA II (Absolute Poverty Alleviation Action Plan), which, to a great extent, is the translation of the MDGs (Millennium Development Goals) into local priorities and strategies, access to water and sanitation is one of the key Government priorities. PARPA also draws part of its contents from the National Water Policy, which places priority on (i) meeting the basic needs of the disadvantaged people, (ii) decentralized management; and (iii) the participation of users in all stages of project development. Services are to be provided by the private sector, in response to community demand, while the Government adopts a facilitating, co-ordinating and regulatory role.

In PARPA I, lack of basic infrastructure services was identified as one of the major determinants of rural poverty in Mozambique and the GoM focused on infrastructure investments to meet its ambitious growth objectives. Building on the lessons learnt from PARPA I, the GoM outlines investment in human capital, including water and sanitation services, as one of the three pillars to meet its sustained growth agenda in PARPA II. As PARPA II notes, investing in water services contributes to meeting not only the short-term objectives of the MDGs, but also Mozambique's long-term growth and poverty reduction plans.

PARPA II and the MDGs recognize the larger social and economic benefits of improved water supply and sanitation facilities, as promoting:

- Health improvement, due to reduction of water-borne diseases, especially for mothers, children and those affected by HIV/AIDS.
- Gender and social equity, due to time saved collecting water, which allows girls to attend school and women to have more time and energies to undertake other productive activities.
- Increases in rural household and community productivity, due to health

improvement.

PARPA II (2005-2009) comes as a continuation of PARPA I (2001-2001) and, together with the NWP, has been reviewed in light of progress achieved and new country challenges and targets related with the MDG targets and Agenda 2025. The review process took place with the active participation of sector stakeholders, represented through the Water and Sanitation Core Group (a donor co-ordination group for water and sanitation), which is co-coordinated by the Embassy of the Netherlands and the Water and Sanitation Working Group (GAS), which is facilitated by the National Water Directorate (co-chaired by UNICEF) involving Government officials and sector funding and implementing partners.

In order to put in place the water policy, particularly in what concerns rural water supply, an implementation manual for rural water supply, the Implementing Manual for Rural Water Supply Projects (*Manual de Implementação de Projectos de Abastecimento de Água Rural* - MIPAR) was produced in 1999 and updated in 2003-4. A series of manuals covering technical, social and institutional aspects of rural water supply, and a separate sanitation manual have been produced by DNA in recent times. The most relevant of these are: (i) Small Systems Water Supply Management Manual and (ii) Rural Sanitation Manuals.

Government Five Year Plan (2005-2009)

In many ways the Government's Five Year Plan is similar to PARPA and it is aimed at reaffirming the adoption of the strategic options during the five years in which the government of the day will be in place. So far, this has been exclusively associated to the ruling party, which has been the governing entity since the introduction of the multiparty system in 1990.

The Rural Water Supply and Sanitation Strategy and Program

In light of recent developments in the water and sanitation sector including the adoption of the MDGs and of a new impetus in poverty alleviation, the MOPH/DNA have decided to embark on better structured strategic avenues for the development of the sector. In December 2003, the Minister of MOPH appointed the Gabinete de Instalação do Centro de Estudos de Desenvolvimento do Sector de Águas (GIC-CEDESA) to start the preparation of the integrated Strategic Plan for the Water Sector (SPWS/PESA). PESA was used to formulate the Rural Water Supply and Sanitation Strategy (DAR,

2006)[8] and later on the NRWSSP. The latter is still in the process of being prepared and a series of documents have been produced including the Program Document (October 2008). The other documents are a Code of Conduct for the water sector; preparation of a draft MOU for a RWSS Common Fund and the pledged support for its implementation by a number of development partners. The four immediate objectives of the program are: (a) Improving quality and increasing coverage and sustainability of RWSS facilities; (b) Broadening the range of technologies and management models; (c) Decentralizing and strengthening sub-sector institutions and human resources; (d) Strengthening the relationship between planning, financing and decentralization. The key subsector issues that the NRWSSP aims to address include: (i) Sustainability of completed water supply facilities; (ii) Fragmentation of subsector activities; (iii) Capacity of RWSS sub-sector institutions and actors; (iv) Private sector capacity and market/supply chain inefficiencies; (v) Incomplete and inaccurate data and deficient information systems; and (vi) Poor quality of work and insufficient supervision of activities (DNA, 2008)[9].

Other Laws and Regulations Relevant to the Rural Water and Sanitation:

Planning and Financial Instruments: PES/OE (Economic and Social Plan/State Budget), which translate PARPA and the Government Five Year Plan into specific annual plans of activities (PES) and respective resource allocation (OE).

Management Instruments: SISTAFE (Public Financial Administration System) was approved in 2001 by the Parliament. It is aimed at regulating public finances by integrating its five subsystems: State Budget, Public Accounts, Treasure, State Patrimony and Internal Control (Law 9/2002). In its final stage it is envisaged that all entities that are part of the public financial administration system will be interconnected by internet (e-SISTAFE), making it easier and faster to manage public finances using a single and integrated system.

Procurement: Decree 54/2005 which among other aspects introduces greater transparency into public procurement of goods and services by making it mandatory to advertise and to publicly open bids and announce bid results.

Decentralization: A series of decrees have been approved with the aim of decentralizing, deconcentrating and devolving power to and strengthening local entities, mainly districts, administrative posts and localities, including villages and

[8] DNA, 2006 – National Rural Water and Sanitation Strategy, Second Draft, May 2006.
[9] DNA, 2008 – National Rural Water Supply and Sanitation Program, Final Draft, October 2008.

communities. Of relevance for rural water supply and sanitation are: (i) Law 8/91 of 18 July 1991 that regulates the free association of citizens and creation of legally recognized associations; (ii) Law 15/2000 of 20 June 2000 that establishes the way by which state entities at the local level collaborate with community authorities; and (iii) Local State Entities Law - LOLE (Law 8/2003) approved in 2003, which defines the principles, organization, powers and operation norms of the local state institutions at the provincial, district, administrative post and locality levels. However, there are still a lot of unclear issues on how decentralization relates to the State Budget planning and management.

Decentralization and deconcentration in rural areas has also been object of pilot interventions that started in 1990 following the publication by the Ministry of Planning and Finance (MPF) and the Ministry of State Administration (MAE), in September 1998, of the Orientações (Orientations or Guidelines) for District Development Planning. After the piloting stage in a limited number of provinces and districts the exercises known as Decentralized Planning and Finance Program/Project (DPFP) are expected to enter into the replication phase countrywide in 2009, which coincides with Year 1 of the implementation of National Rural Water Supply and Sanitation Program. This will certainly have significant implications with the future of rural water supply and sanitation.

A few aspects characterizing decentralization of governmental powers and functions in Mozambique cover: [10]:

"*In Mozambique the state administration consists of four levels below the central state: provinces (10 + the capital), districts (128), administrative posts (343), and localities (1048). The state administration is strictly centralised, whereby the President of the Republic nominates provincial governors, sectoral ministries nominate provincial directors of respective services, and the Ministry of State Administration (MAE) nominates district administrators (DAs). Concerning the last two the Governor is consulted, while he is responsible for nominating chiefs of the administrative post and of locality.*

In 2003 a new law on local state organs on provincial and lower levels (Law no. 8/2003) was passed by the Parliament, and in the same year MAE and the Ministry of

[10] *Consultancy on Performance Audit in the Water Sector, Water Supply and Water Resources Management*, Republic of Mozambique, Ministry of Finance, Inspectorate General of Finance (IGF), Dutch Embassy, Draft, March 2006:17.

Planning and Finance (MPF) published inter-ministerial guidelines for interpretation of the new law (Participação e consulta comunitária na planificação distrital, Junho 2003). The law provides for deconcentration and decrease in administrative bureaucracy, aiming at creating a leaner central structure and bringing key public services nearer to the people. Regulations for Law no. 8/2003 were passed by the Council of Ministers in June 2005 (Decree no. 11/2005). In these statutes new consultative organs, called local councils, were created at district, administrative post, locality and village levels.

The district government is a local organ of the central Government charged with realising the government program, social and economic plan (PES) and government budget in the respective territory with powers to decide, execute and control the planned activities. It consists of the DA, the district permanent secretary, and directors of sectoral district services (Decree no. 11/2005).

The District Development Plans (PDDs) which are elaborated by district governments in collaboration with civil society organisations and the respective provincial government are - in conjunction with the economic and social programme (PES) and the state budget (OE) for the district - the key planning instruments where sectoral and area-based approaches are integrated in concrete terms.

Experience from local planning experiments like the Local Development Programme (started in 1998 in Nampula funded by The Netherlands and from 2003 in Cabo Delgado funded by Norway) and the Programa de Planificação e Finanças Descentralizadas (PPFD - started in Zambézia, Sofala, Tete and Manica in 2004 and funded by World Bank), underline the need to harmonise sectoral approaches to planning with the established procedures of district planning and budgeting. Both programmes are implemented by the Ministry of Planning and Development (MPD). According to recent government policy it is the district, and not the sector, which should have clear ownership over the planning process, based on the participatory planning method and the local consultative organs established in Decree no. 11/2005. Sectoral funds (e.g. for agriculture, water, roads) should, therefore, complement the annual district budgets as conditioned grants on the basis of district PESs".

The decentralisation process effectively delegates all responsibilities for development from the central to the district and municipal level. At the district level, rural infrastructure planning bodies have been recently created and are currently being further developed. The National Directorate of Water (DNA) has great difficulties

addressing the challenges of decentralisation, both conceptually as well as in finding workable strategies for capacity building at the local level. A host of national and international organisations are also preparing to assist in this effort. Within this context mention needs to be made of CFPAS, who is being tasked with the training of district level technicians and of local NGO's, and of SNV, who will be involved in capacity building for the Dutch-funded, UNICEF implemented, 1 million people project in the central region of Mozambique.

The governance structure for WASH (not including the large urban water utilities) will summarily resemble the following:

- *National level retains the role to set policies, develop strategies and regulate the sector*
- *Provincial level will mostly be responsible as a channel for investment funds with the procurement role at provincial level*
- *District level will take on full responsibility for the decentralised provision of all O&M services in the water supply sector.*

The necessary capacity building process is still in its infancy, as well as the various methodological steps and strategies necessary to operationalise the decentralisation process. "

2.2 KEY ACTORS AND ROLES IN THE SUB-SECTOR

The planning, implementation, monitoring and evaluation of RWSS is financed by the Government of Mozambique supported by a number of development partners. These two main actors are complemented by national and international NGOs spread all over the country. The share the water sector receives from the total state budget has been in the order of 2.2% – 2.5% in the period until 2005 (IOB, Review of International Support the Netherlands, 2007). In 2008 it was expected that external support to the entire water and sanitation sector would be in the order of 67%. Rural water supply and sanitation subsector is most dependent on external aid as so far it has limited self-financing capacity and the government is unable to draw resources from other sources to channel to it. There has been a marginal increase in budget share over the past few years. This combined with improved execution rate, over 80% of donated money to the water supply and sanitation sector in recent years, contributes to a positive momentum

in terms of projects brought to successful conclusion in the sector.

Before MCC funded by the American government, the Netherlands was the largest bi-lateral donor in the water sector only trailing the multilateral donors (ADB, World Bank and European Union). Thus policy shifts adopted by that donor for developing aid may impact in the sector. The first indications towards a significant policy change in the sector date back since 2000. The IOB report "Institutional Development, Netherlands Support to the Water Sector 1988-1998 (March 2000)" outlined some of the weakness the Project Based Support Approach was faced with in terms of efficiency and robustness in addressing the sector challenges. As a result the Government of the Netherlands agreed with other donors a shift to Sectoral Support to the Water Sector (*Apoio Sectorial ao Sector de Águas,* or ASAS), which has been in place since 2002 and works as a broker and conduit of aid to the water sector. Unfortunately for 5 years only the Dutch Government supported ASAS reducing the expected impact. Meanwhile the GoM and the partners created a dialogue platform in some provinces (e.g. Nampula) water actors form what is known as GTAS[11] (Water and Sanitation Thematic Groups) that work as coordinating platforms in the sector at the provincial level.

In light of internal dynamics and influenced by Rome Agreement and Paris Declaration efforts have been underway to place the government in the driving seat for water and particularly RWSS. Up to now the role of the main stakeholders can be defined as described in the following subchapter.

2.2.1 GOVERNMENT

MOPH

From the government side and in line with Ministerial Diploma 217/98, in Mozambique, responsibility for the water sector lies mainly with the Ministry of Public Works and Housing (MOPH). MOPH comprises four main technical areas of operation[12]: (i) water; (ii) buildings; (iii) roads & bridges; and (iv) housing & urban development. From the territorial perspective MOPH is represented at the central and provincial (DPOPH) levels. The structure that deals with public works and housing at the district level is not necessarily part of MOPH although it receives guidelines and different forms of direction in what concerns core areas of this ministry. There is no MOPH representation at the two lowest levels of the state structure, namely Administrative

[11] These bring together the Government, Donors and NGOs.

[12] Translated into specific National Directorates.

Post and the Locality. General sector organizational structure is depicted in figure below.

FIGURE 1: Water and Sanitation Institution Organogram in Respect To MOPH. *Dashed line indicates indirect relation and solid line direct relation and subordination) source DNA*

DNA and the central level

The National Directorate of Water/ Direcção Nacional de Águas (DNA) is the primary directorate under MOPH responsible for water resources management in its various forms. The figure above depicts graphically the position of DNA within MPOH and its various technical and administrative units.

In the last few years DNA has been engaged in the decentralization, deconcentration and devolution of its core activities in crucial areas such as: management of river basins, urban water supply and sanitation and rural water supply and sanitation.

- River basin management is being passed on to the ARAs. ARAs South (Sul), Centre (Centro), and Zambeze (Zambeze River Basin) have been established

and are in operation whereas ARA Centre-North (Centro Norte); and North (Norte) are in the process of being established.

- In 1998 urban water supply started its delegated management through FIPAG/CRA. Urban sanitation has been passed on to the municipalities with certain responsibilities falling under the ministries of health, education and environment; and
- Rural water supply is the main responsibility of DPOPH/DAS. This is in the process of being extended to small piped systems (SPS) in a model that is being tested in a series of towns such as Vilanculos, Quissico, Massinga, Magude and Namaacha (private-commercial model).

In more recent years the Department of Rural Water (DAR) at the DNA has been strengthened significantly in order to fulfil its role of promoting, coordinating and regulating the expansion of water supply and sanitation services to the rural communities. Starting from 2009 the current targets are of reaching 70% coverage of rural water supply and 50% coverage of rural sanitation, by 2015. DAR comprises the following sections: (i) Management Support; (ii) Planning, Monitoring and Evaluation; (iii) Communication and Training; and (iv) Studies and Projects.

In principle sanitation at the DNA is under the Department of Sanitation (DES). This department comprises three sections, namely: (i) Management Support; (ii) Studies and Projects; and (iii) Evaluation, Monitoring and Training. The department focuses mainly on establishing guidelines, developing pilot interventions and in monitoring, evaluation and training. There are several entities active in sanitation in planning and implementation of activities that range from municipalities (for urban areas), the ministries of health and environment and the rural water supply entities at the various levels. It should be noted that medical waste and hazardous waste management fall under the ministries of health and environment, respectively.

The Ministry of Health and the Ministry of Environment also have a number of responsibilities in regard to hygiene education and awareness covering aspects such as the active involvement of households and individuals in maintaining a cleaner environment, in fighting against cholera, malaria and other environmental diseases and epidemics. A combination of factors including the prevailing institutional arrangements for sanitation, with its various actors and lines of responsibility, may be behind what is perceived as low visibility, limited interventions and impact in this important social

service. This is also seen as perpetuating a paradigm that needs to be changed worldwide in order to place sanitation in its right position, within one institution and with its own separate budget lines.

However, and mainly in as far as water supply is concerned, it should be noted that because the decentralization process and the involvement of other private operators in the water sector in Mozambique are still in their early stages of development, DNA finds itself in a hybrid situation where in addition to policy, regulation, monitoring and evaluation functions, it retains important operational functions in some areas. It retains operational functions in areas to be covered by ARAs Centro-Norte and where delegated management for water supply has not yet been implemented. The same applies to municipalities where the delegated management is in the process of being initiated as well as in areas (mainly SPS) where DPOPH/DAS is not yet in position of undertaking rural water development. To a great extent this means that at times DNA is more involved in operational issues than in policy and regulation.

Overall DNA's capacity to undertake this large mandate is stretched. A major consequence is a fragmented approach and projects are undertaken by various donors with inadequate coordination provided by DNA. Further, systems that are built suffer from inadequate implementation and follow-up support and up to 35% of rural systems are not working[13] and are in need of repair at any one time. A World Bank recent assessment[14] pointed out that "*Limited institutional capacity leads to weak absorptive capacity as donor funded projects have generally experienced under-spending as a result of DNA's weak internal procurement and financial management skills*". The GoM and sector donors have recognized these shortcomings and DNA and the major donors have recently agreed to move towards a comprehensive SWAP for the rural water sector (i.e. the NRWSSP). This approach harmonizes sector planning and monitoring, and provides for more effective aid modalities, in line with the Paris Declaration.

DPOPH/DAS and the provincial level

At provincial level DPOPH has the most direct participation for water sector operation within MOPH and represents the ministry at this level. DPOPH has a unit that deals

[13] World Bank, 2007, Republic of Mozambique Water Services and Institutional Support Project, Project Appraisal Document

[14] Ibid

specifically with water and sanitation (DAS), which at present focuses by and large on rural water supply with a few “ad hoc” responsibilities for urban water supply. The organizational structure of DAS is shown below, although there are some variations from province to province and efforts are underway to harmonize the way in which these entities are structured and operate, it basically comprises five major units: (i) wells and boreholes (water points); (ii) small systems; (iii) sanitation; (iv) database and (v) social work. In the past there was an hydrometric unit under DAS. It does not have a separate unit assigned to the urban water supply sector.

FIGURE 2: DAS Structure

The provinces are expected to provide capacity building, monitoring and evaluation required at district and local levels to perform tasks related to provision of WASH related services and goods. They are also expected to coordinate and integrate the various sources of funding for local development. These come from government, NGOs and other development partners. Some procurement, technical standards, etc. should also be done at the provincial level. Under the DAS there were 10 Provincial Workshops for Rural Water (EPAR for peri-urban and rural sector)/Estaleiros Provinciais de Água Rural (EPAR). EPARs were responsible for construction activities in rural areas. In light of the policy shift to a greater private sector intervention role in construction and rehabilitation there is now a process to turn them into more autonomous bodies. In 2006 it was estimated that 8 out of the 10 EPARs in the country were not financially viable but that they had with them 16 drills most of which were obsolete (MCC/MCA, 2006)[15].

However, DAS's offices are weak in terms of quantity and technical capabilities of their staff. Most of DAS personnel are basic[16] and middle[17] level technicians, graduated from CFPAS. The main advantage being that they are usually qualified in water and sanitation issues, but less so in planning and management. There is also the perception that the creation of autonomous institutions, such as FIPAG, CRA, ARAs, municipalities, etc. has deprived other central and provincial water and sanitation institutions from attracting and retaining highly qualified technical personnel. DNA at central level has lost a significant part of its qualified personnel to these institutions. At provincial level the hydrometric task, which used to be under DAS and dealt with river flow and water quality monitoring, is since the creation of Regional Water Authorities a mandate of these institutions. The DAS staff that were responsible for river flow and water quality monitoring have been reassigned to ARAs. This situation resulted in the loss of capacity at DAS to undertake its mandate on Water and Sanitation given that for many years the staff at the hydrometric section where more involved in the Water and Sanitation project rather then their tasks. The transfer of staff from DAS to ARA's is thus seen as loss of capacity at DAS.

[15] MCC/MCA, 2006 – Rural Water Points Installation, Mozambique Water and Sanitation Project Version 1 – Dated June 1, 2006

[16] Equivalent to full junior secondary education with a technical component in water and/or sanitation.

[17] Equivalent to full secondary high school with a technical component in water and/or sanitation.

District Services of Planning and Infrastructure and Health, Women and Social Affairs Services

Under the most recent restructuring (2003) of the government at the district level four major units or services have been created to run government issues at this level, namely: (i) Economic Activities, (ii) Education, Culture, Youth and Technology; (iii) Health, Women and Social Affairs; and (iv) Planning and Infrastructure. Water and sanitation fall under Planning and Infrastructure Services (SPI) at the same time that Health, Women and Social Affairs Services (SDMAS) have a certain number of responsibilities for sanitation. In addition to water supply and sanitation Planning and Infrastructure Services are also responsible for other areas of activity such as (a) roads and bridges; (b) housing and buildings; (c) mineral resources and energy; (d) environment; and (e) transport and communication. Figure 3 depicts the existing units.

FIGURE 3: District Administration Organogram[18]

Revisiting a concept that dates back from the late 1970s and early 1980s, the government is increasingly defining the district as the most important administrative unit in the general planning and promotion of national development.

Guidelines for District Development Plans adopted in 2003 reinforce the role of the districts as planning and budgeting units. The guidelines open space for the creation of local (district, administrative post and locality) consultative councils to act as an interface between the civil society, the public and the local authorities in the planning, implementation, monitoring and evaluation of development activities.

However, at present, the main obstacle to overcome in order to translate this new role into a reality is the capacity of government personnel and that of other existing entities and systems at this level. In what was intended to be a measure to reinforce the district as the main development units, starting from 2007 and on an annual basis the existing

[18] Lei 8/2003 – BR 20 – Suplemento – I Série. Estabelece princípios e normas de organização, competências e funcionamento dos órgãos do Estado nos escalões de província, distrito, posto administrativo e de localidade.

128 district governments have been receiving MZM 7.0 million (approximately US$ 300,000.00) to promote local development. So far the money has been used to finance a diversity of activities ranging from public works, credit to micro and small businesses identified as relevant in the promotion of local socioeconomic development. Initial assessments highlight that there is a need to better clarify the objective of such an allocation and the way in which the money should be used. As it is, at times, certain uses of the money clash with other established interests e.g. authorized lending institutions or are seen as promoting political interests in favour of the ruling party.

SPIs and SDMAS are generally understaffed in terms of numbers as well as in what concerns quality of their personnel. Anecdotal evidence points to the fact that most of the people working in and/or leading these services are new recruits to the public sector and as far as SPIs are concerned in spite of more often than not being qualified in construction, in many cases they are not specifically qualified in water and sanitation. Where possible and with the support of different development agencies a series of actions have been underway to speed up their integration into the public sector and to build their capacity to handle technical and managerial issues directly associated with their work. Except for a few cases the district governments are also not well equipped in terms of other resources necessary to run public sector business in today's world, including a generalized lack of ICT resources (personnel, hardware and connectivity). Under these circumstances e-SISTAFE cannot include most of the districts.

2.2.2 DONORS

In spite of a considerable growth in Government revenue, in more recent years, the country still continues to be highly dependent on external aid. According to the OECD-DAC[19], Mozambique is the world's eighth most aid-dependent country. More than half of total public spending and about two-thirds of public investment depend on external aid. This is extended to water and sanitation and particularly to rural water supply and sanitation where a series of donors have been active in providing different forms of support, including funding. The most important donors are the Netherlands, DFID, UNICEF, AfDB, MCC, CIDA, Ireland, SDC, EU, WaterAid, CARE and the World Bank. Figure 4, below, is an attempt to present the list of the most important donors in the sub-sector, distributed by their geographical areas of operation. In 2006 AfDB and the

[19] OECD/DAC, 2006 – "The Challenge of Capacity Development, Working Towards Good Practice.

WB provided 40% and 35% of the total aid support to the water sector, respectively, which turns the two into the biggest donors in the sector.

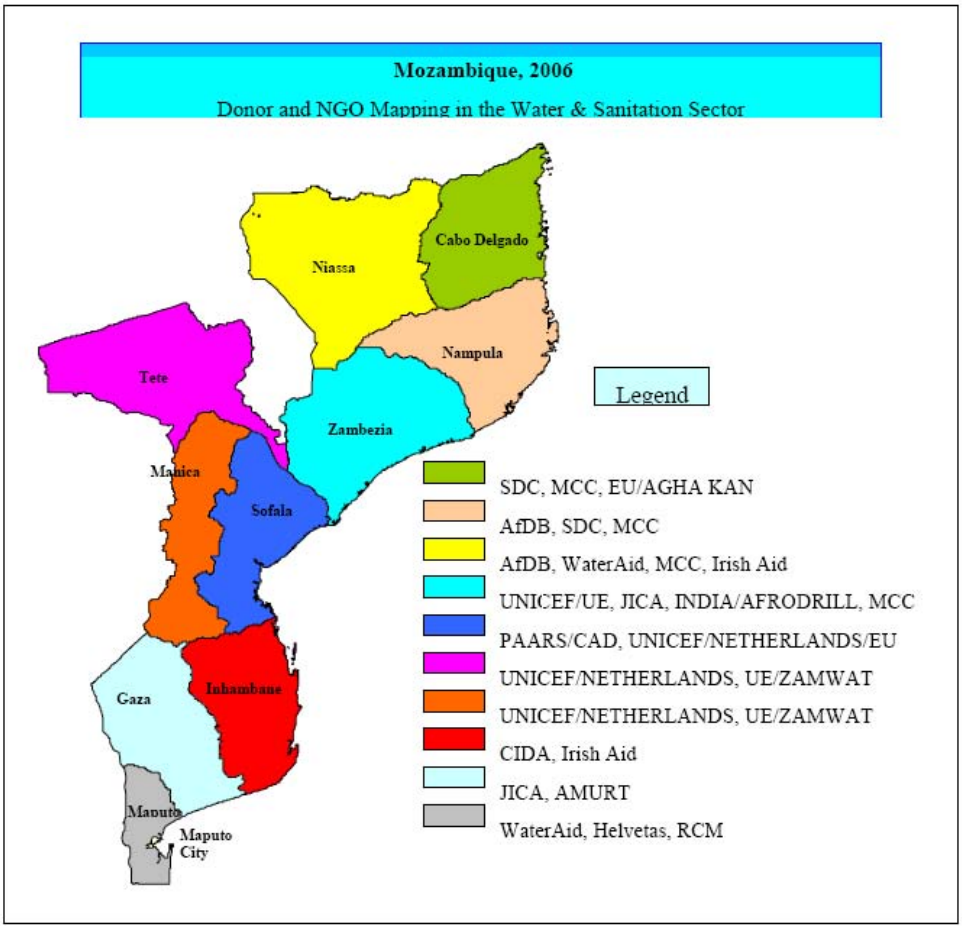

FIGURE 4: Geographical Distribution Of Donors In The Water And Sanitation Sector

2.2.3 NGOs AND CBOs

As already indicated, government and donor interventions in rural water supply and sanitation are complemented by national and international NGOs and CBOs spread all over the country. NGOs and CBOs play a double role in the sub-sector: at times they design and implement their own projects and programs (using the private sectors and/or local activists) and at times they are subcontracted by the government and/or the donors to implement programs and projects on their behalf. It is estimated that in 2007 the NGO contribution for rural water supply and sanitation reached 17% of the total number of new or rehabilitated water points. For the 2009-2011 RWSS program this contribution is expected to decrease to 5.9% while the total investment in the

subsector increases (DNA, 2008)[20]. This is mainly explained by the fact that the projections exclude direct NGO funding made by donors that are now shown as direct funders. In addition to contributing to the capacity building of public entities mainly at the provincial and district level, they also play a crucial role in education and awareness creation in regard to water supply and sanitation within the communities. In their capacity as institutions operating at the field level they also play a crucial role in the identification of needs and in the planning process. The integration of the NGOs and CBOs in the District Consultative Councils has increased the relevance of these organizations in the project/program identification and planning. Annex 2 is an attempt to present a full list of all existing NGOs in RWSS.

Under Decree 55/98 of October 13, International NGOs (INGOs) operating in Mozambique is required to register with the Ministry of Foreign Affairs and Cooperation (MNEC). At the time of the registration, MNEC seeks clearance from the relevant sector ministries. On a bi-annual basis, INGOs are required to submit biannual reports and detailed plans, including detailed financials. These are then used to extend or deny the continuation of work of the INGOs. Sector ministries are also consulted in this process.

At a macro planning level, this process is an excellent but underutilised opportunity for the sector ministries and government as a whole to better coordinate the work, plans and methodologies of the INGOs. When INGOs engage at provincial level, very few Provincial Governments utilise their authority to coordinate the activities of NGOs. At District level, as long as NGOs actually engage with District Government (not yet the case), then coordination actually does seem to happen, particularly as the lines between sector ministries become more blurred at district level i.e. better sectoral coordination within the government institution often leads to better coordination of the external actors. There are reasons to believe that government would gain a lot if it would simply insist on this coordination and lead it. Many NGOs would welcome this, and those that would not, would eventually come around. It is perfectly possible for the government to approach this positively, not as a policing action, but as a developmental one, and would have easy access to funds and support to make it happen.

[20] DNA, 2008 – National Rural Water Supply and Sanitation Program, Final Draft, Annex 8 – Analysis of the Financial Gap, October 2008.

2.2.4 BENEFICIARIES

There is a potential of 14.1 million beneficiaries represented by an equal number of people living in rural areas (INE, 2005). Current standards state that for dispersed communities a borehole/well equipped with a manual pump or a protected source should serve 500 people (around 100 households) in a radius of 500 metres. Although this figure is widely used to assess coverage it remains highly contested by different sectors. Several rural water supply evaluation reports point to the fact that with prevalence of scattered occupation of land and community highly dispersed very few water points in the country do achieve the intended coverage. The situation might be different for people who are agglomerated or living in towns and villages where a Neighbours' Tap or a Standpipe could serve 500 people consuming 20l/day. In general consumers are organized in Water and Sanitation Committees, which at present have a strong informal character. This is seen as being critical and in need of change. Water and Sanitation Committees focus mainly on water supply and have limited intervention on sanitation. In principle they interact with the water and sanitation development entities and organize consumers to use water sources adequately and to participate in operation and maintenance. To that effect water users contribute in cash or in kind.

2.2.5 PRIVATE SECTOR

Private entities that provide goods and services to the subsector are concentrated in Maputo and the provincial capitals and exist in the form of contractors (drilling, construction, etc.), consultants (studies, works supervision, facilitation, etc.), and suppliers (water, equipment, parts, consumables, etc.). The scale of procurement of goods and services in rural water supply and sanitation is not conducive to the proliferation of business operators in the subsector and less so to their establishment below the provincial level. Availability of goods and services beyond the provincial capitals remains a serious constraint.

DAR is using the diagram presented below to summarize the roles and responsibilities of the main actors in rural water supply.

Table 1: Roles and responsibilities of the various actors in rural water supply

Roles and responsibilities		Actors/Timeline		
		Current	Short Term	Long Term
Definition, coordination and dissemination of policies and strategies at national level		DNA		
Planning of rural water supply	Strategic planning	DNA DNA+DPOPHs		
	Operational program and investment program	DNA DPOPH+ADs	DNA+DPOPHs	
Management of promotion and implementing resources	Mobilization of funds	DNA DNA+DPOPHs		
	Management of funds	DNA	DPOPHs	DPOPH+ADs
	Asset Management(PSAA)	DPOPHs	Ads/Municipal Councils	
Implementation	Construction contracting	DNA DPOPHs	DPOPHs	DPOPH+ADs
	Construction (disperse sources and PSAA	Private sector EPAR NGOs		Private sector
	Operation, maintenance and management of dispersed sources	DPOPHs	Ads Private sector	
	Operation, maintenance and management of PSAA	Ads	Private sector Public Autonomous Managers (ADs)	
Implementation support activities	Establishment and management of an information system	DNA	DPOPH	ADs
	Studies and Research	DNA	NGOs Private sector CEDESA	
	Education and assistance to the users	EPAR/NGOs/CBOs Private sector	Private sector NGOs	
	Capacity building of provincial and district authorities	DNA	NGOs Private sector	

Source: DNA (2006)

The essential aspect is that DNA is gradually passing implementation responsibilities to other entities while it retains a stronger role in coordination, supervision and planning as well as in playing a leading role in the mobilization of funds.

The table below summarizes the roles and responsibilities of the main actors in rural sanitation.

TABLE 2: Roles and responsibilities of the various actors in rural sanitation

Roles and responsibilities	Actors/Timeline

		Current	Short Term	Long Term
Definition, coordination and dissemination of policies and strategies at national level		DNA		
Planning of rural sanitation	**Strategic planning**	DNA		DNA+DPOPHs
	Operational program and investment program			
Mobilization of funds		DNA	DNA+DPOPHs	DPOPHs+ADs+CMs
Management of funds		DNA, DPOPHs	DPOPHs, Ads	ADs
Implementation	**Construction**	Households NGOs CBOs		Private Sector, CBOs, NGOs
	Maintenance	Households	Private Sector	
	Education and assistance to the users	Ministry of Health and DNA	NGOs and CBOs	
Implementation support activities	**Capacity building of provincial, district and municipal authorities**	DNA+DPOPHs	DNA, DPOPHs, NGOs, Private sector	Private Sector, NGOs
	Establishment and management of an information system	DNA	DNA+DPOPHs	DPOPHs, ADs
	Studies and Research	DNA	DNA, NGOs, Private Sector, CEDESA	

Source: DNA (2006)

In addition to reaffirming what was said about the DNA gradually passing implementation responsibilities to other entities while retaining coordination, supervision and planning and leadership in the mobilization of funds, the above table also testifies the existence of multiple actors in sanitation. As already indicated the multiplicity of actors in the various aspects of the provision of sanitation services is seen by some people as being the source of most of the problems that affect the subsector, including what is perceived as being a limited visibility.

2.3 HISTORICAL PERSPECTIVE OF RURAL WATER SUPPLY AND SANITATION IN MOZAMBIQUE – PAST, PRESENT AND FUTURE

2.3.1 THE COUNTRY CONTEXT

The end of the war in 1992 and the deepening of the market economy processes as well as the opening of Mozambique to the external world have created adequate conditions to formulate new development strategies for public administration and particularly the state financial administration. In the late 1990s a series of reform measures were designed and put in place such as: decentralization (and power devolution) through the establishment of municipalities[21], public sector reform through the establishment of new system of careers and remuneration; reform of the budget planning and programming system through the restructuring of the then Ministry of Planning and Finances[22], the approval of the State Budget Law with its new budget classifiers and a new fiscal calendar, the formulation of instruments for medium term allocation of resources (PTIP: Public Triennial Investment Plan/*Plano Trienal de Investimento Público* that later on became the Medium Term Expenditure Framework/*Cenário Fiscal de Médio Prazo*).

In 2001, the public sector reform (2001-2011) was initiated. Its main objectives are to: 1) make the sector more effective and efficient, 2) ensure the creation of an enabling environment for the private sector, 3) curbing corruption, 4) delivery of goods and services to the population at large with a particular emphasis on the poor, thus contributing to the reduction of poverty and therefore the attainment of PARPA objectives. Its main components are:

1. Decentralization and restructuring;
2. Improved policy formulation and monitoring process;
3. Enhancing professionalism of the public sector;
4. Improved public financial management and accountability;

[21] The possibility of political devolution to elected forms of local government at the rural district level was ruled out. However, the government was open to start new and more participatory forms of administrative decentralization (deconcentration) in the districts. This lead to the establishment of the establishment of a series of initiatives and pilot actions including the Decentralized Planning and Finance Program (DPFP/PPFD).

[22] The government that came out of the 2004 elections split this ministry into two, i.e. the Ministry of Planning and Development (MPD) and the Ministry of Finance (MF).

5. Promoting good governance and curbing corruption; and
6. Management of the reform process itself.

In 2001 the Parliament approved the law that regulates public finances (Sistema da Administração Financeira do Estado (SISTAFE)), with its five subsystems: State Budget, Public Accounts, Treasure, State Patrimony and Internal Control. SISTAFE focus on budget execution and financial accountability mechanisms. The idea is to create a single State Account, which would make it easy at any time to control liquidity and cash flow and consequently a better management of available resources. The implementation of this system requires a full integration of all financial management systems and thus solid ICT and human resources bases.

As mentioned, administrative decentralization is crucial in the ongoing public sector reform. It highlights the role of local administration entities including municipalities in service provision to the people in general as well as the piloting of decentralized planning and financing at the district level. To regulate this, the law on Local State Entities - LOLE (Law 8/2003) was approved in 2003. However, there are still a lot of unclear issues on how decentralization relates to the State Budget planning and management.

To complement the general reforms a series of sectors have been developing their strategic or medium term development plans. Such has been the case of (a) agriculture and rural development [23](PROAGRI); (b) education (PASE); (c) higher education and technology[24]; (d) health; (e) tourism; and more recently the water sector.

Strategic planning is also starting to gain shape at the provincial and district levels. At these levels strategic plans focus more on territorial development than on sector issues. Although it is felt that there is still a need to clarify the links between these two sides of the equation.

The existence of strategic sector/provincial/district development plans has been stimulating the formulation of alternative ways of providing financial assistance by external entities. More integrated ways of providing external assistance have been gaining shape ranging from support to sub-sectors (e.g. common fund to purchase drugs, books, etc), to sector support (PROAGRI, PASE), and Budget Support (Macro-Financial Support or Budget Support by the G19). Discussions and actions to support

[23] These two sectors were integrated in a single ministry before the 2004 general elections.

[24] Idem.

provincial budgets have also been underway (e.g. Swedish and Irish support to Niassa and Inhambane).

The Rome Agreement and Paris Declaration have brought new elements into the above-mentioned processes. To a great extent Mozambique was already seen as a test case for harmonization and alignment since 1998-99, when five donors started to coordinate general and sector budget support (GBS) in an attempt to reduce overburdening government capacity in dealing with a diversity of agents and strengthen its planning and financial management systems. At present there are 19 GBS donors pooling around 26% of total aid into the budget. However, two thirds of Mozambique's aid still stays outside of the system and is channelled directly into line ministries, provinces and districts as sector funds or under traditional project modalities.

2.3.2 The Water and Sanitation Sector and Its Rural Sub Sector

At first and for many years, donors and NGOs in the water sector and to a great extent the government itself focused on a project approach whereby, based on their inclination, each agency would take responsibility for specific areas of the sector/sub-sector in specific regions of the country on a project by project basis.

According To Williamson (ODI, June 2005 in IOB, Assessment of the Dutch Policy for International Aid 2008) some of the most prominent characteristics that influence the role and place of the water and sanitation sector in the Poverty Reduction Strategies are: i) Slow progress in reform in the water sector when compared to other sectors; ii) Institutional fragmentation in implementation; iii) Little coordination in the implementation of the sector reform processes; iv) predominance of multiple donor projects with different aid modalities and implemented through different institutions; v) poor targeting of investments; vi) Weak and unpredictable public expenditure management systems leading to weakening the likelihood of alternatives aid instruments like budget support; vii) No proper engagement of the WSS stakeholders in PRSP process. However, the last decade has witnessed a considerable effort to act in a more coordinated manner.

The National Rural Water Supply and Sanitation Program (NRWSSP) for the period 2009-2015 embraces the sector wide approach (SWAP) in the RWSS sub-sector. It is envisaged that there will be a Common Fund for the sector which is expected to be used as a means of gaining the experience necessary for making informed decisions regarding transition to budget support in the sub-sector, in the years to come.

3 EXISTING UNIT COST INFORMATION

3.1 UNIT COST AND STRUCTURES

Cost structure and composition is a function of several factors among which (i) implementation structure of the program; (ii) range of technological options in use; (iii) socio-economic environment; (iv) market size or work continuity; (v) specifications in use; (vi) environmental setting or hydro geological setting. Although it may seem to be many variables, most of them they are usually lumped resulting in fewer key variables to analyse.

However, in order to understand the sources of costs and identify actions that can lead to reduction in costs, one would have to analyse all these several variables in detail. For the current study we will concentrate on key structured variables that lump most of the important costs associated with provision of services to local communities. The following aspects are therefore considered:

- **Programme implementation cost (Indirect/Direct Support Costs)**. This relates largely to institutional capacity and functionalities required to support the implementation of the programme and the tasks required for smooth run of the programme.
- **Technical costs (Direct Support Costs)**. This relates to the cost associated with the design, supervision and monitoring of the works.
- **Local community participation (OPEX or CAPManEX)**. This relates to sustainability of the interventions and includes such issues as availability of spare parts, user's financial contribution and existence of local capacity to handle routine maintenance.
- **Private sector organization for provision of services (CAPEX or Capital Costs)**. Normally it will be translated into costs for provision of services such as drilling, rehabilitation, supply of services, goods (equipment and parts), etc.

The costs of capital are also affected by the way contracts are managed specially in relation to delays in payment and organization of the financial systems. The private sector in most cases incurs large costs in providing bank guarantees for the contract while clearance of invoices in government contract can take 4 months in average. Because of strong intervention of donors the cost of capital is not well known in

Mozambique.

There are other factors affecting the cost of interventions in the water and sanitation sector. As way of introduction the following headings will discuss important aspects related to the rural water supply that ultimately define the way programmes are implemented in Mozambique.

3.1.1 STANDARDIZATION OF DESIGN

In Mozambique the DNA has developed standardized designs of wells and boreholes for rural water supply. These are used as basis of judgement of quality of work performed by a contractor. These standards do not differentiate between different geological conditions.

The concept of standardization is based on compromise. Its positive aspects are related to objectives such as lowering costs, facilitating quality control, improving implementation rates, and facilitating private sector involvement. Typical negative aspects include the design not always being the most appropriate for local conditions, not being conducive to technological development, limiting "client" involvement in design, amongst others.

Standardization has been pointed out[25] as major source of increased cost in rural water programmes across Africa. It inhibits innovation and may at times affect negatively potential yield of borehole. Nevertheless, as mentioned above in an environment of weak institutions for proper supervision and follow-up this serves the purpose of protecting the investment and reduces the risk of poor construction works that ultimately affect the lifespan of infrastructure.

Borehole design and implementation

Boreholes or deep wells are the most used option in water supply provision. Nearly 80% of water supply infrastructure in use are boreholes equipped with different types of pumps.

The standardized design of a borehole for rural water supply, including superstructure and pump. The standard design of the borehole for rural water supply is based on the following ideas:

[25] World Bank – Water and Sanitation Program (WSP), Global Knowledge Network for Rural Water and Skat Foundation November 2004: Solutions for Reducing Borehole Costs in Rural Africa; Field Notes.

- The dimensions used for borehole design encompass the application of a hand pump, but also makes it possible for the water point to be upgraded from hand pump use to a small piped system;
- Use of proper filters, filter packing and borehole development (purging) ensures that physical water quality does not adversely affect the lifespan of the pump;
- Sanitary protection of the well with apron
- Casing down to the bottom can be applied in any geological circumstances[26]

Well design

Wells make up to some 15% of existing groundwater extraction technology in Mozambique. There are two different types of "wells": the dug well often of a large diameter (more than 0.8 m) and the tube well (few inches e.g. 4"). Aside from community choice and the desired hand pump, the choice of water source technology depends on hydro geological aspects involved in the choice between these options:

- Depth of water table can preclude the use of a dug well;
- Limited formation yield can negate the use of boreholes because of their limited intrinsic storage capacity;

The tube wells are not known in Mozambique. There has been some past experience with tube wells for piezometer installation in groundwater monitoring projects around Maputo city.

The dug well has been used extensively in Mozambique. To facilitate the implementation during the National Rural Water Programme (PRONAR) the government created the Provincial Drilling Companies (Estaleiros Provincial de Água - EPAR's) equipped with the necessary equipment (mainly casting moulds for concrete rings) for their implementation. Most of the EPAR's are defunct institutions with serious financial problems caused by the shift in government policy that allowed the introduction of private sector participation in water sector. Moreover, with the introduction of Demand Responsive Approach, the dug well has been "marginalized", mainly because communities are given the option of choice, and in general the majority choose a borehole. The community rationale behind this is not well known, but it is suspected that this choice is based not on sound information about the pros and cons

[26] Other designs such as open well design night be cheaper but can only be applied in hard rock

of the two options, but on a general perception that a borehole is better. Hand dug wells are also constructed with limitations one of these is that often they are not made deep enough to cope with adverse climatic conditions such as prolonged droughts that affect the water level the other is that they often have limited yield when compared to boreholes.

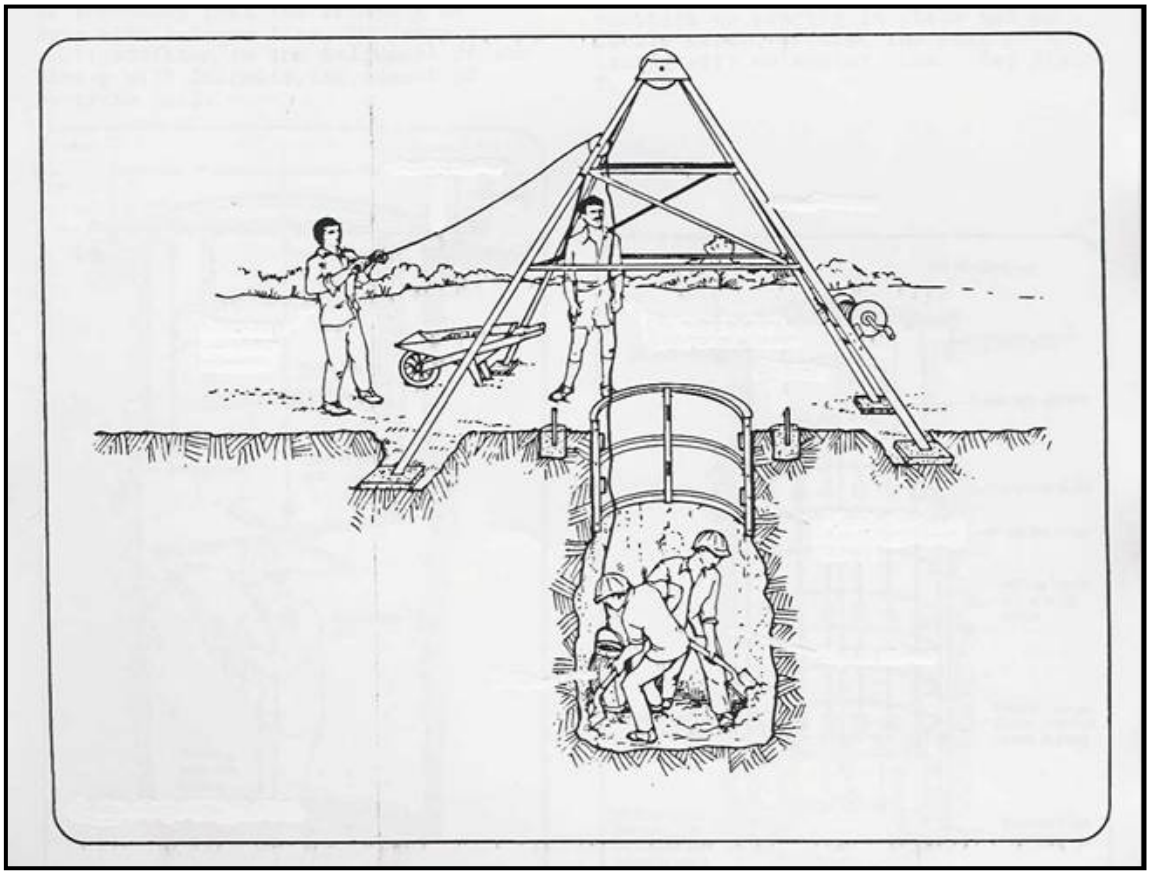

FIGURE 5: Implementation of a Hand-Dug Well

Superstructure Design

Superstructure refers to the part of the installation that is above ground. The casing that protrudes out of the ground, both in the case of the borehole and the well, is considered not to be part of the superstructure. The superstructure has three functionalities (i) to support the containers for water collections (ii) as sanitary seal and (iii) foundation to support pump.

Hand pump

The MIPAR defines as the standard hand pump to be used the AfriDev model. The

choice of AfriDev followed several years of testing of different hand pumps in Mozambique. This pump is being imported from abroad as well as being manufactured in Mozambique. The pump costs vary significantly between $600.00 and $1,500.00 (2008), depending on the province, and sub-type of AfriDev. In recent years several different sub-types of AfriDev are being sold in the market. The differences between these various sub-types range from the type of material used in certain components, type of connection used in rods (threaded or hooked). Officially the government only accepts one of these sub-types of pump that holds a certification from a National Engineering Laboratory (LEM). This pump is the most costly of all the sub-types but apparently more reliable and the one that spare parts can be sourced from Maputo vendor. Afridev handpump has shown limited sustainability, mainly due to supply-chain and backstopping mechanisms required for long-term success, such as availability of spare parts, skilled technical support for major repairs, and sound collection systems for water charges to support recurrent costs.

AfriDev is used only for boreholes with water table of less than 45 meter bellow that depth there is no standard pump in use. At one time Volanta pump had been suggested but with limited success it was never adopted as standard pump for deep boreholes.

There are other pumps popular in parts of the country made popular by NGO's one such pump is NIRA pump used in northern Mozambique. This pump is only for shallow water table typically of less than 20 meter. Another NGO in Niassa province introduced an alternative low cost pump for shallow water tables typical of less than 15 meter. This is a Rope pump build locally with involvement of local artisans. Although it has not been officially adopted as standard pump it is often mentioned in official documents as a possible option. .

Overall the introduction of standard hand pump technology in Mozambique cannot be considered as an entirely successful experience. The experience with AfriDev is a mixture of failures and successes that can be attributed to different factors ranging from lack of community ownership of the infrastructure; failure of any spare part market initiative tried in the country; nature of technology that requires intensive maintenance and considerable time from community; high operational cost due to recurrent breakdowns and long distances to the nearest dealer; poor training of local community to maintain the pumps, etc.

The reasons behind standardization of the AfriDev as the hand pump for rural water supply are not so much related to the relative quality of the pump, but more towards experiences of international donors in other countries. Standardization of a hand pump was assumed to stimulate private sector involvement in spare parts supply. The VLOM concept (Village Level Operation and Maintenance) was relatively new to Mozambique, and the AfriDev was the hand pump designed specifically in the light of that concept. The private sector has shown little interest in selling spare parts for the pump mainly because of the time the spare parts take at the shop before they are sold out.

FIGURE 6: Examples of Pumps: AfriDev (Left) and Locally Produced Rope Pump (Right)

Other Technologies

Rural water points are interpreted in this study as wells or boreholes equipped with a hand pump. However, if the borehole or well has sufficient yield, it could also be equipped with more sophisticated systems using external energy sources such as diesel, grid electricity or solar power. The pumping system would pump water to an elevated tank and the water could then be distributed by gravity to different outlets, for instance standpipes or yard connections.

These kind of extended systems need a whole extra range of skills and resources to be available to the community. These systems need a much more permanent and professional operator-caretaker structure than the VLOM (Village Level Operation and Maintenance systems). Investment costs are easily fivefold that of a hand pump water point, and operational costs are also much higher. Therefore, the system needs to be

placed in a community that has a certain cash-based economic activity level that can pay for this.

This type of technology is being use in many peri-urban areas with the involvement of private operators.

FIGURE 7 Typical Small Scale Water Service Provider in Peri-Urban Areas

These systems are being successfully self-disseminated by the private sector with little interventions of the government in many peri-urban areas and rural villages. The enabling environment for this type of infrastructure is the positively perceived economic condition of the community by the investor and the hydro geological setup of the area. Since most of the villages in peri-urban areas lack formal water services the market is fairly large for such kind of a system.

Springs and Rainwater harvesting

Springs and rainwater harvesting are another less common technology used as complementary to direct groundwater abstraction. Rainwater harvesting are sometimes a viable technology in the arid areas in southern Mozambique while springs are commonly proposed in the northern areas of the country.

Rainwater harvesting is based either on roof or ground-surface collection of water then stored in tanks. There are several designs of both collection surfaces and storage that can be used. There are basically two distinct forms of infrastructure in use in the

country mainly the family system and communal system. The communal systems are often build to serve a number of families often between 5 and 15. Schools also tend to adopt this type of infrastructure in their rainwater harvesting structures for basic hygienic use by school pupils. There is very little information on cost of construction of any of the type of rainwater harvesting.

Springs are another type of technology that is used especially in the northern parts of the country, though sporadically. The infrastructure is normally a small structure that cause the impoundment of water to be collected for use. In few cases spring harvesting is used to serve relatively large villages water supply scheme (more than 10 000 people e.g. Malema in Nampula). The cost of the infrastructure is also variable between few thousand US$ to several thousands (e.g. $60 000) (source: ASNANI staff members oral information).

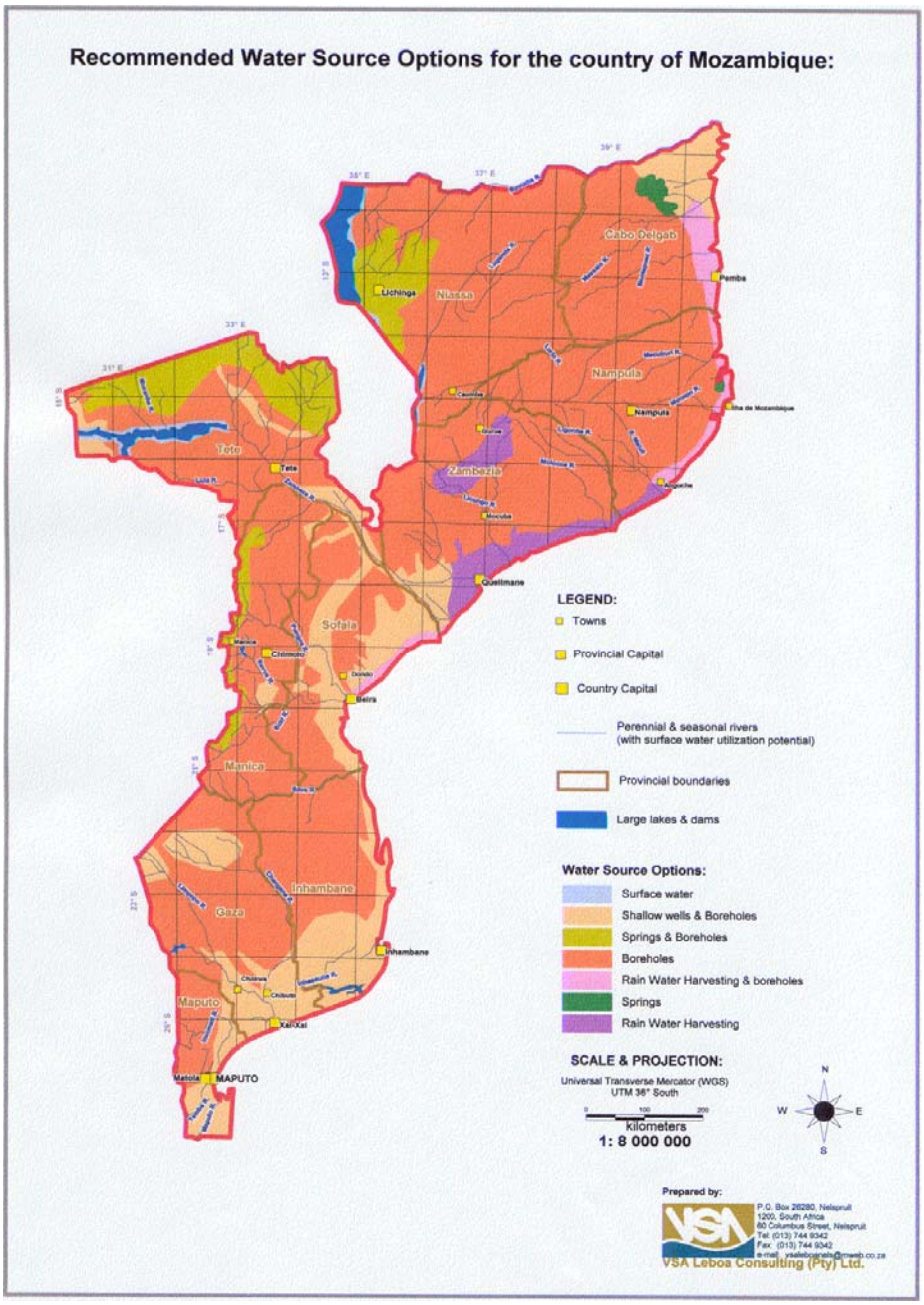

FIGURE 8: MAP of Appropriate Technology for Rural Water Supply (SOURCE: Technical Manual for Implementation of Rural Water Supply Projects)

Figure 8 [27]gives a global country perspective in terms of viable technological options for water supply that ultimately relates to the potential cost for provision of services.

[27] Technical Manual for Implementation of Rural Water Supply Projects

3.1.2 IMPLEMENTATION OF RURAL WATER SUPPLY PROGRAMS

Rural water supply programmes in Mozambique are supposed to be implemented following the Manual for Implementation of Rural Water Projects (MIPAR). MIPAR outlines the step and content of each phase of the implementation of a rural water programme in Mozambique. The document consists of 4 parts dealing with different phases:

Awareness Creation: to provide the user of the manual and the community as a whole the information needed to plan and implement a rural water point, including information on the different options available;

Phase 1. Planning: to identify the different sources and technology options available, plan the implementation, develop the actual water point, and the abstraction and distribution of water;

Phase 2. Implementation: to understand all aspects involved in implementation, divided into 4 parts: 1. Evaluation of water quantity and quality, 2. Roles and responsibilities, 3. Water source components, 4. Abstraction and distribution of water

Phase 3. Operation and Maintenance: To understand all aspects involved in operating and maintaining the water system, divided into 3 parts: 1. Overview of definition of operation and maintenance, 2. Developing an O&M plan, 3. Activities of O&M.

The implementation of these activities is done mostly with the involvement of NGO's and social consultants for the awareness and community capacity building while technical consultants are engaged in planning, design and supervision of construction.

The involvement of consultants in the implementation of rural water programme is guided by two supplementary MIPAR documents the Technical Manual and the Social Manual. These documents outline the procedure and steps followed in the implementation of each activity of water project. These documents contain standard procedures to be followed in the design and implementation of activities in rural water projects.

Figure below shows the different steps for a rural water supply programme and illustrates the different roles key players have in the process. It can be used to identify the cost structure in rural water programme.

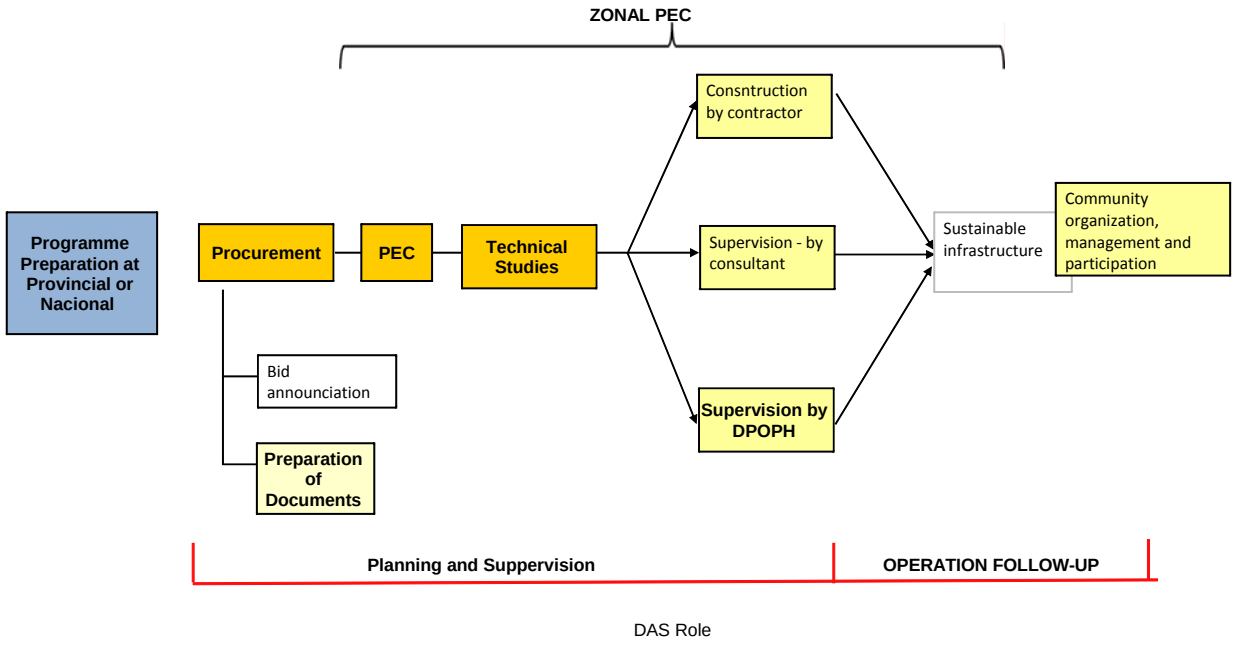

FIGURE 9 Implementation of Rural Water Programme

In this case a large rural water programme will start with programme preparation either at national or provincial level. This step defines the way the project will be implemented including the institutional arrangements to be put in place for it. For government programme and under current decentralization context the actual implementation of the programme will be under the responsibility of DPOPH through DAS. The DAS will be responsible for procuring the services of consultants and contractors for the work. There are mainly three types of contract in this case (i) social consultant contract; (ii) technical design and supervision contract; and (iii) construction contract. Lately and following experiences in some provinces a fourth category of contract has been added that is operation and maintenance contract. For boreholes these contracts are entered into between a community or group of communities with service providers such as local mechanics. The over-sighting of these contracts is the responsibility of district government.

The three contracts for the implementation of water point installation programme need supervision from DAS throughout the implementation. In this case it can be said that the implementation budget of rural water programme needs to cover the following costs:

- Operational cost of DAS to perform its duties from procurement to supervision of the implementation;

- Cost for engaging an NGO of social consultant to undertake the community participation work including training;
- Cost for engaging a technical consultant for design and supervision of works; and
- Costs for construction.

The long-term sustainability of the investment requires maintenance of the infrastructure. In Mozambique infrastructure maintenance is the responsibility of beneficiary communities. They should get organized and decide the best way for guaranteeing the maintenance of the infrastructure. In some cases they may opt to contract services from local mechanics or get organized through the water committee to have their internal capacity for minor repairs.

3.1.3 Rural Sanitation Program in Mozambique

Overall the sanitation sub-sector is poorly structured as compared to the water supply sub-sector. Although, with relatively less actors when compared to rural water supply this sub-sector is faced with several challenges e.g. lack of well articulated policy, under-funding, multiple players at ministerial level.

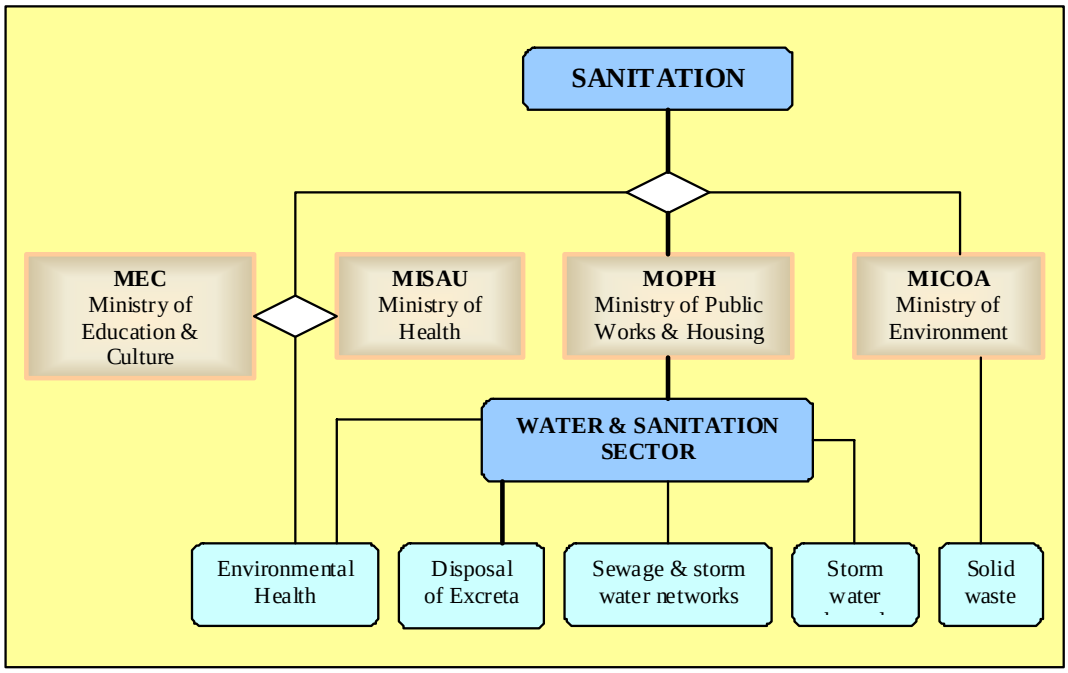

FIGURE 10 KEY Ministries Involved in Environmental Sanitation "Sub-Sector

Actor's" (UNICEF, 2006[28])

The history of the sanitation sub-sector structured interventions in Mozambique start in 1989 with the introduction of the Pilot Project for Rural Sanitation in the Provinces of Cabo Delgado, Tete, Sofala and Inhambane. The pilot was part of the PRONAR and was implemented with collaboration from the Ministry of Health and the National Institute for Physical Planning/ Law Cost National Rural Sanitation Program (INPF/PNSBC)[29]. In 1997 DNA prepared a preliminary rural sanitation strategy '*Política e Estratégias de Saneamento Rural'* in move to relaunch the development of the rural sanitation component and its integration into water. This strategy centred on the use of improved traditional latrine using local material and community sanitary education campaigns.

In 2006 DNA prepared the national technical and social rural sanitation guidelines[30]. These guidelines describe a selection of technological options and give emphasis to improved traditional latrine dissemination as mechanism to fast track rural coverage. The guidelines also pointed do the need to promote hygiene and behaviour change, increase the number of alternatives and the constructions of rural demonstration latrines. In essence the rural sanitation strategy in Mozambique is based on the following:

Rural Sanitation Technology	Minimum level of service: improved pit latrine (an improved latrine using local materials). Promotion of hygiene practices and sanitary education at family and community level.

The standards to be followed in the implementation of the strategy are given in the Improved Latrines Manual[31], describing the various improved latrine models (including the improved pit latrine) and how to construct them. While the Sanitation Animators' Manual[32], is the basic standardised tool for the work of sanitation animators.

[28] The Government of the Netherlands -UNICEF Partnership: Water, Sanitation and Hygiene Mozambique Project Proposal

[29] PESA-ASR

[30] Directrizes Técnicas (DNA, 2006)

[31] National Low Cost Sanitation Programme, INDER, Maputo, 1994.

[32] INDER, National Low Cost Sanitation Programme, 1995.

According to DNA guidelines Traditional Improved Latrine is composed of circular cesspit of 0.8 m diameter or rectangular 0.6x1.5 m, with a depth of 2-4 meters[33] lined with local materials if the ground is know to be unstable. This cesspit is to have a platform with lid covering the hole and a superstructure with basic ceiling made of basic local materials to reduce light penetration and provide some privacy to the user.

As described in the RWSSI (2nd Draft), it is not easy to evaluate the current access to rural sanitation, as defined by the standard adopted by DNA (improved pit latrine). The only reliable statistical data available on Rural Sanitation coverage is from the 1997 Census (23%), which did not use DNA concept of the improved pit latrine. Extrapolating the 1997 Census data to the present, DNA/DER calculates that in 2002, approximately 27% of the rural population had adequate access to sanitation[34].

There are very little data on desegregated cost for sanitation and hygiene promotion in Mozambique. The visit to Sofala revealed the following figures that can not be used for national reference:

Ecological Latrine	MZM 10 000
Improved Latrine	MZM 1050 or 450 (subsidized)
Improved Traditional latrine	Not given

The superstructure (Laje) or cover slab as the following costs:

Cover slab for vulnerable people	MZM 420
Cover slab for non vulnerable people	MZN 450
Subsidized complete latrine	MZN 850
Subsidized complete latrine	MZM 1030

These costs will vary from place to place and depend on several factors among which cost of material and labour and transport.

[33] in practice most latrines are less than 2 m deep
[34] DNA, Plano Económico e Social (PES 2005) – Proposta, August 2004.

In recent years there has been a move to introduce new alternative technology such as the Ecological Latrine to address some of the limitation that the pit latrine and traditional latrine technologies are faced with in areas of high groundwater table[35].

The UNICEF-Netherlands Partnership programme is the first large scale intervention initiative in the sanitation sub-sector since the pilot project mentioned above. This project will be implemented in the provinces of Sofala, Manica and Tete in central Mozambique.

3.2 Main Sources of Unit Cost and Structures and Level of Consistency

In theory and as a way of simplifying the equation it can be said that the price/cost of every water supply and sanitation good or service, every time it is accessed and/or used (e.g. 20 l of water, use of sanitation facilities, etc.) incorporates all incurred expenses to make related facilities, goods and services available. The costs range from (i) Capital investments in fixed assets (CapEX); (ii) Operating and minor maintenance expenditures (OPEX); (iii) Capital maintenance expenditure (CAPManEX); (iv) Support costs (direct and indirect); (v) Cost of capital (WASHCost, 2008)[36]. In more detail these terms are used in this report and study as having the meanings described in the table below:

[35] Observation by Wateraid: Niassa and Zambezia, WaterAid subsidizes latrine construction up to slab level for traditional improved, improved and Fossa Alterna (a type variation of ecological latrine). All of these have similar "technical costs", varying from MZN300 to MZN500. In peri-urban areas where all pits are fully lined with concrete block, and labour is more expensive, this cost can reach MZN1,500.

[36] WASHCost Research Protocol – Draft for discussion 12th June 2008.

TABLE 3: WASHCost terminology

Terminology	Description
Capital investments in fixed assets (CAPEX)	The amount invested in constructing fixed assets such as concrete structures, pumps and pipes. Investments in fixed assets are necessarily occasional and therefore 'lumpy' and are therefore best addressed through conventional 'accrual' or fixed asset accounting procedures which are a method of distributing these costs fairly (so as not to disadvantage any particular consumer group) over the lifetime of the assets.
Operating and minor maintenance expenditures (OPEX)	Expenditure on labour, fuel, chemicals, materials, purchases of any bulk water. Most costs estimates assume OPEX between 5 and 20% of capital investments. In practice, maintenance is skimped everywhere (even UK and USA).
Capital maintenance expenditure (CAPManEX)	Expenditure on asset renewal and replacement costs, based upon serviceability and risk criteria. Accounting rules may guide or govern what is included under capital maintenance and the extent to which broad equivalence is achieved between charges for depreciation and expenditure on capital maintenance. Capital maintenance expenditures (CapManEX) and potential revenue streams to pay those costs are critical to avoid the failures represented by haphazard system rehabilitation.
Support costs (direct and indirect)	In utility management support costs such as overheads are usually included in opex. However, they are rarely included in rural water and sanitation cost estimates. For this reason we have kept them separate in this exercise. The costs of ensuring that the local government staff have the capacities and resources to help the communities when systems break down or to monitor private sector performance are usually overlooked. Other expenditures on direct support costs include environmental and economic regulation, customer involvement costs, etc. Indirect support costs include government macro-level planning and policy-making, developing and maintaining frameworks and institutional arrangements, capacity-building for professionals and technicians.
Cost of capital	Expenditure on the weighted average cost of capital representing interest payments on debt and dividend payments to the equity providers. Very context specific but an indicative 5% on current costs fixed assets have been used. However, many non-networked services are provided based on grants or soft loans.

Source: Fonseca, 2007

On the other hand OFWAT (2005) provides a good definition of “capital maintenance”:

Companies are required to maintain the operating capability of their asset systems to ensure continuity of service for current and future customers. For above-ground assets companies apply a current cost depreciation charge based on the expected life of these assets. For below-ground assets, companies apply an infrastructure renewals charge. This reflects the expected costs, averaged over a period of many years, of maintaining the serviceability to customers of these long-lived assets. The charges recorded in the accounts may differ from the costs of maintenance actually incurred in the year in question. When we assess relative capital maintenance efficiency, we use the actual costs recorded in the accounts averaged over a period. Other factors that may affect the unit costs of capital maintenance are detailed below:

- the quantity of inherited assets;
- the age and performance of inherited assets;
- differing assumptions used to estimate the volume of water delivered;
- differences in accounting practices between companies; and
- previous management decisions on the balance between capital and operating expenditure.”

The table below presents a list of specific components for water and sanitation:

TABLE 4: Specific components for water and sanitation

Terminology	Components for water supply and sanitation
Capital investments in fixed assets (Capex)	Water supply specific: Water resources facilities; boreholes;
	Sanitation specific: Sludge management and treatment equipment; vacuum trucks and other transport containers
	Water supply and sanitation: Offices, IT systems, maintenance vehicles, depots and warehouses; land for protecting water quality; extension of the distribution (non networked)
Operating & minor maintenance expenditures (Opex)	Labour; power costs, fuel, chemicals, cost of materials; Water source protection and conservation, point source water treatment, non network water distribution; Maintenance of transport containers, vacuum trucks and equipment, fuel and oil; discharge fees to sludge treatment plants; sludge management and treatment.
Direct support costs	Overheads of intermediate support agencies, community capacity building, hygiene awareness and education campaigns, etc.
Capital maintenance expenditures (CapManeX)	Rehabilitation and replacement, catchment protection, pit digging, constructing the latrine slab, pit latrine/septic tanks emptying fee, rebuilding latrine
Costs of capital (debt and equity)	Cost of interest repayments on a loan; exchange rate variations; bank fees
Indirect support costs	Institutional capacity building and skills training at local government and national government levels; Built-in incentives to prevent a local "brain drain" once technical and administrative staff is trained – and until a critical mass of people is trained; Development and maintaining IWRM, water and wastewater management and development plans; Economic regulation, development and maintaining monitoring and assessment information systems; Ongoing development, refining and implementation of policy

Sources: Franceys, Perry and Fonseca. 2006; Cardone and Fonseca. 2003.

To the above listed major and standard costs other costs such as time spent to access the goods and services due to distance, competition between what households/individuals have to do to access water supply and sanitation and meeting other basic needs (food, energy, education, health, etc.), and other obstacles that may explain that people are prevented and/or prevent themselves from having access to those goods and services and therefore suffer the consequences in many ways (health, poor life quality, etc.), can be added.

As can be seen it is not an easy equation and this is further compounded by the multiplicity of actors and funding and reporting mechanisms that prevail in the Mozambican RWSS subsector. On the basis of the main cost categories, in abstract terms, Table 5, below, is a first attempt at trying to describe a few possible and existing

sources of water and sanitation costs. It is expected that the same table will be further developed as WASHCost Project progresses. A few other sources are also discussed and presented in this subchapter and then included in the document as annexes.

TABLE 5: Summary of sources and structures

	Sources of Information and Structures							
Cost Category	**Government – Level/Remarks**		**Donors/Remarks**		**NGOs**	**Communities/ Asset User**	**Private Sector/Remarks**	
Capital investments in fixed assets (CapEX)	Plans and disbursements made by the government mainly at central and provincial level. Budget execution reports	The fact that DASs at the provincial level are not budget execution entities makes it difficult to disaggregate costs	Pledges and disbursements (budget support and direct support at central, provincial, district and local levels)		Plans and disbursements	Contributions/community books	Tender documents and contracts.	Lack of technology uniformity, standards and regulation make it difficult to compare prices/offers.
Operating and minor maintenance expenditures (OPEX)	Plans and disbursements. Budget execution reports	Mainly where communities are unable to meet these costs	Pledges and disbursements (budget support and direct support)		Plans and disbursements	Contributions/community books	Supply of goods and services. Invoices	Excessive concentration at the provincial capitals also works as an obstacle to disaggregation
Capital maintenance expenditure (CAPManEX)	Plans and disbursements. Budget execution reports		Pledges and disbursements (budget support and direct support)		Plans and disbursements	Not known/Probably not applicable	Supply of goods and services. Invoices	Excessive concentration at the provincial capitals also works as an obstacle to disaggregation

	Sources of Information and Structures							
Cost Category	**Government – Level/Remarks**		**Donors/Remarks**		**NGOs**	**Communities/ Asset User**	**Private Sector/Remarks**	
Support costs (direct and indirect)	Plans and expenditure reports following budget classifiers (personnel, goods and services, training, travel, etc.). Audit reports	At the provincial and district level data not disaggregated. Public expenditure managed as a whole for all subsectors.	Pledges and disbursements. Audit reports. (budget support and direct support)		Expenditure following budget classifiers (personnel, goods and services, training, travel, etc.). Audit reports	Not known/Probably not applicable	Audit reports (not available)	There are reasons to believe that the private sector spends very little in this category, mainly due to poor coordination among the various stakeholders, mainly public/private relations.
Cost of capital	Agreements between the GOM and lending institutions (e.g. World Bank, AfDB, etc.) on the cost of capital		Loans to the government		Not known	Not known/Probably not applicable	Bank loans for operations including investments and respective servicing. Interest rates	Most of the transaction are confidential and not easily accessible

Under the currently existing planning, budgeting and budget execution systems and mechanisms what is noticed is that most of the costs are aggregated and as such of limited use for decision making processes. For instance it is known that over a period of around 5 years (2003-2008) ASNANI was expected to spend US$ 23.36 million distributed as shown in Table 6:

Table 6: ASNANI budget structure

Areas Covered	**%**
Construction and Rehabilitation of Water Sources	25
Project Management & Technical Assistance	20
Community Mobilization	18
Base Studies	7
Parts, Audit and Running Costs	7
Training & Institutional Development	6
Studies in the Four Cities	4
Vehicles and Equipment	3
Supervision	2
Offices & Houses	2
Sanitation	2
SPS	2
Study for ARA Establishment	2
Total	**100**

Source: ASNANI, 2008

It becomes evident that construction and rehabilitation, as well as project management and technical assistance and community mobilization consume most of the resources but at the lowest level of the decision making process, e.g. at the district and community level and even at other levels this information is of limited value to guide the planning, implementation and operation and maintenance of specific water supply and sanitation services, since these entities have limited direct involvement with these cost categories. .

Tables 5 and 6 give closer estimates of the unit cost for water points by technology with Traditional PEC, in 2008[37] and 2009-2011 projections for sanitation costs. These are

[37] Estimates were based on projections of data obtained in 2005, by considering inflation and increase in fuel costs.

the kind of costs that would be useful for the WASHCost Project, which are still in need of improvement and perfection.

TABLE 7: Unit cost of water points by technology with traditional PEC

Item	Boreholes		New hand dug well
	New	Rehabilitated	
Drilling, including hand pump	7,300[38]	3,200	4,500
Quality Assurance/Fiscal [2]	1,095	480	675
Supervision	730	320	450
Contract Management	730	320	450
PEC: Community Organization and O&M Training	2,200	2,200	2,200
Total	12,055	6,520	8,275

Source: RWSSP, 2008

To deliver value for money by efficient and effective use of resources requires that all cost categories and sub categories be known and applied to meet the pro poor water and sanitation in the implementation of strategic priorities. As already stated this requires cognisance of (i) implementation structure of each program; (ii) range of technological options that are available and can be used in a specific setting; (iii) socio-economic environment; (iv) market size or work continuity; (v) specifications in use; (vi) environmental settings or hydro geological settings.

Using the example of one area that is well known, i.e. water supply and borehole, which are the most common in RWSS subsector it can be said that presently there are three types of drill companies, namely: (i) private companies (21); (ii) parastatal companies (10 EPARs[39]); and (iii) ONG's (5) operating a total of 71 drill equipment with diversified capacity and types, which represent a total potential capacity of 2,200 boreholes per year (RWSSP, 2008). Depending on the size of the projects/programs and respective needs of goods and services regional and international companies are also called up to make their offers.

In a country marked by disparities and regional imbalances like Mozambique the costs of water and sanitation goods and services vary according to local (region or country)

[38] PESA-ASR Average cost per borehole, USD 6,393 from 2005 plus 10% inflation and increase in fuel costs according to actual prices from 2008 (UNICEF).
[39] Of which only 5 are confirmed as being operational

and the company costs assumed for the process which involve many variables, such as:

- Mobilization costs;
- Borehole configuration (casing material, diameter, etc.);
- Drilling depth;
- Type of borehole pumping testing;
- Taxes;
- The payment procedure (if it is payable only positive borehole)

The cost of a borehole also depends on several factors where the most important are:

- Time to Drill
- Ground depth
- Conditions (geology)
- Crew Ability
- Rig capability
- Distance to Site
- Labour Rate
- Vehicle running, maintenance & depreciation cost
- Fuel Cost
- No. of Site Visits
- Labour Requirement
- Diameter

TABLE 8: Rural sanitation costs (2009-2011)

Average Cost for Sanitation in USD	Unit Cost	No of Units	TOTAL	%
Construction of 5 Demonstration Latrines per centre	92	269	1,485,000	10%
Equipment of Local Artisans Associations	10,000	1	600,000	4%
Demonstrative Centres for Water and Sanitation Construction Cost per District	4,000	240	2,880,000	19%
Social Marketing: Hygiene and Sanitation Promotion per district including training for community wash promoters for two years	110,000	20	3,300,000	22%
Prizes for Communities well succeed per District	10,000	20	600,000	4%
Community self-construction Cost of Latrine (including material and labour)	40	2,692	6,461,000	42%
Total Estimated Cost of Sanitation per Year in USD			15,326,000	**100%**

During this initial stage of the WASHCost study there it was found that all these elements are still in need of consolidation in order to provide useful data for the decision making at the various levels.

The existing data on costs does not allow a detailed analysis since most of the data is aggregated and the contribution of each of the components can not be traced. There is also a problem of multiple players using different tools and reporting systems. At government level the separation between the technical and budgeting/reporting departments increases the difficulty in finding cost data. The DAS at provincial level do not always keep record of the cost associated to their activities that support the implementation of projects and guarantee the long-term sustainability of services at community level. The existing annual activity reports at DAS do not contain cost information and do not attempt to link the activities and outcomes in terms of WASH services.

The most predominant type of data available across the sector refers to CapEx and this is largely variable across the country. One of the aspects influencing the variability of CapEx is related to the poor geographic distribution of service providers and availability of material and spare parts that the contractor can have easy access to. For example most contractors have their workshops for major repairs located in Maputo from where

they can order parts from abroad. This is one such factor that increases the variability of cost in water supply services provision across country.What can be concluded is that the existing financial planning, implementation, monitoring and reporting that characterize most of the role players in rural water and sanitation results in poor consistency of financial data. Although a great level of alignment with the government systems and procedures has been gaining shape lately there is still a lot of work to be done to ensure validity and credibility of the data used by the various actors. A brief review of the current planning and budgeting instruments in the following chapter underscores the sources of existing inconsistencies.

4 PLANNING AND DECISION MAKING PROCESSES AND SUPPORT SYSTEMS AND TOOLS

As it will be illustrated in the following subchapters the various actors in the RWSS use a diversity of systems and mechanisms to plan, implement, monitor, evaluate and report their activities, projects and programs.

4.1 PLANNING, FUNDING AND MANAGEMENT MECHANISMS AND SYSTEMS

4.1.1 GOVERNMENT

In recent years the Government of Mozambique has been making concerted efforts to follow the six main stages involved in the planning and budgeting process and public expenditure management (PEM). According to the World Bank (1998) and as espoused by the GOM the main objectives of the PEM in any context are to[40]:

(d) **Maintain fiscal discipline**: by keeping spending within limits created by the ability to raise revenue and keep debt within levels that are not prohibitively expensive to service.

(e) **Promote strategic priorities**: by allocating and spending resources in those areas that make the greatest contribution to the government's objectives.

(f) **Deliver value for money**: by efficient and effective use of resources in the implementation of strategic priorities.

In line with these objectives PARPA and the Government's Five Year Plan set the tone for the planning and budgeting that is being developed and the process covers the following main stages[41]:

- **Policy review**: This consists mainly of an annual evaluation of the results of public planning and expenditure to inform the updating of policies and plans. In principle this takes place in January when the sectors and relevant State institutions submit to the Ministry of Planning and Development (MPD) and Ministry of Finance (MF) their PES and Budget Execution Reports. MPD and

[40] Oxford Policy Management (2001) "Introductory Course in Public Expenditure Management, Background Training Materials, For DNPO, Ministry of Planning and Finance, Government of Mozambique", Oxford, OX1 1BN

[41] Idem

MF then consolidate the various inputs into single reports (i.e. PES and OE execution), which are submitted to the Parliament in February for review and approval.

- **Strategic planning**: Based on PARPA and the Government's Five Year Plan this consists in setting expenditure and deficit targets, on the basis of macroeconomic projections and financial commitments made by the various budget actors, over 3 years. As part of this process, medium-term policy targets and expenditure priorities are specified and the medium-term expenditure framework (CFMP) is formed. The formulation of CFMP is mainly the responsibility of MPD. MPD is also the entity responsible for PARPA preparation. This is done in consultation with all relevant stakeholders. In relation to PARPA II this also involved Civil Society Organizations (CSOs). CSOs are also active in regular PARPA monitoring and evaluation through the Poverty/Development Observatory, convened at least once a year at the provincial and central levels. However, it should be noted that a few analyses indicate that, at present, the level of harmonization and coherence between the various planning instruments (i.e. PARPA, Government's Five Year Plan, CFMP, PES and OE) are rather weak. The water sector had its first CFMP in 2007 for the period 2008-2010 (DNA, 2007). The implications of it for the RWSS are dealt with in Chapter 5.
- **Budget preparation**: submission and negotiation of the ministries and other state institutions of expenditure bids within plan and budget guidelines and expenditure limits circulated by the MPD and the Ministry of Finance (MF). This process starts in April at the district level and culminates with the preparation of PES and OE by the MPD and MF in August after having harmonized the contributions of the provinces and the central institutions prepared in June and July. PES and OE are then submitted to the Cabinet and to the Parliament in September in order to be sanctioned/ approved in December.
- **Budget execution**: after the approval of the budget appropriations, the resources are released to the spending agencies to implement expenditure programmes. This takes places from January to December. Basically funds are released on a monthly basis. In the case of the water sector the official flow of funds of the internal budget, including financial resources allocated by fully

aligned donors is from Treasury to the water institutions. At national level funds are transferred from the Treasury to the MOPH and from there to either the DNA and/or other autonomous water institutions (FIPAG/CRA, ARAs, etc.). Where the provincial governments have approved water activities in their provincial PES, the funds are transferred from the Treasury to the Provincial Directorate of Planning and Finance (DPPF) and from there to DPOPH and subsequently to DAS. At the moment DAS are not directly executing the budget they do it through the DPOPH's Department of Administration and Finance (DAF). This makes it somehow complicated to disaggregate DAS expenses from the expenses made by other departments within DPOPH, particularly in regard to current expenses including personnel. The districts receive a fixed budget directly from the Treasury through the Ministry of State Administration. The later also applies to the municipalities. The SDPIs and the SDMASs which have water and sanitation responsibilities face the same problems as the DASs. They do not execute the budget directly and their current expenses can hardly be disaggregated from the expenses made by other district departments. Figure 11, below, is an attempt to depict the structure of the flow of funds from the various sources to the different budget execution and management agencies considering the various categories of these funds, namely: (i) on budget; (ii) off budget; (iii) common funds; (iv) provincial and district funds. The figure tells about the diversity of sources and funding mechanisms, which among other work as obstacles to the development of a consistent and easily shared cost analysis.

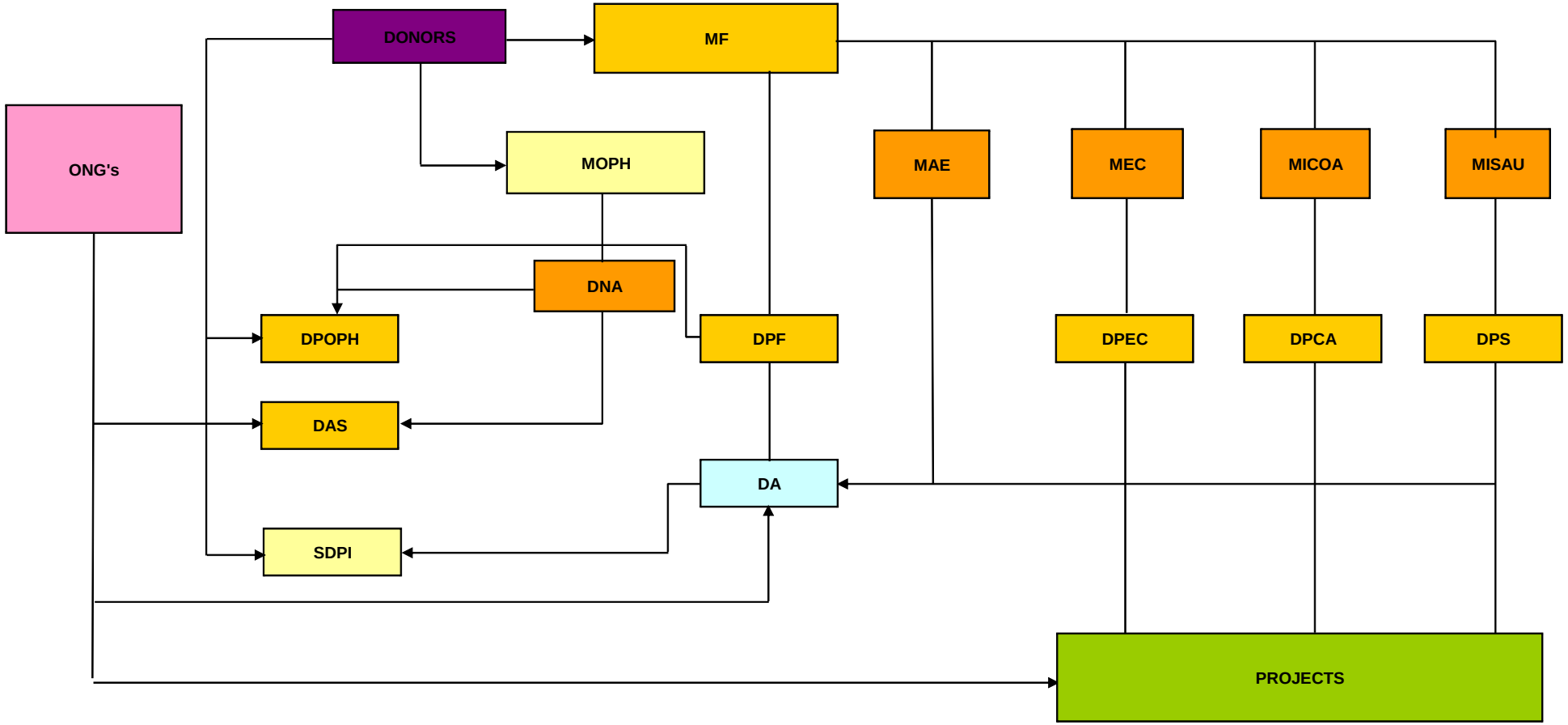

FIGURE 11 Flow of Funds from the Various Sources to the Different Budget Execution and Management Agencies

- **Accounting and monitoring of expenditures and revenues**: tracking the composition and level of revenue and expenditure over the year and monitoring the outputs of expenditure. It is generally acknowledged that weak elements remain in the overall public expenditure management system in the country, and consequently, implementation often diverges noticeably from plans. In a situation where DAS and SDPI/SDMAS do not have direct budget execution responsibilities they tend to ignore the financial component in their monitoring systems. Actually one can hardly talk about a coherent monitoring of the RWSS system in which these two important levels have a real participation. The quarterly reports that they prepare hardly follow a pre determined structure and are not conducive to the preparation of consolidated reports at any level.
- **Reporting and audit**: the Administrative Tribunal (TA) reviews compliance with the budget, reporting in detail to Parliament and initiates corrective actions as necessary. In a situation where the monitoring instruments are weak it is to be accepted that the national final reports are full of information gaps and do not portray the real situation on the ground (mainly provinces and district).

Annex 4 presents an overview of the above-mentioned stages as they are used in the Mozambican planning and budgeting process, while Figure 12, below, depicts the same process in contexts in which DPOPH operate in a decentralized way.

FIGURE 12 Annual Planning, Levels and Institutions

Six principles are at the core of the process, namely: (i) political engagement and commitment to the budget; (ii) policy clarity, consistency and affordability; (iii) predictability; (iv) transparency; (v) comprehensiveness and integration; and (vi) accountability.

Any of these principles and their combination evoke harmonization and strengthening of planning and budgeting instruments and to a great extent they call for the pooling of funds from the various sources to finance unified strategies, plans and a budget steered by one single entity, in this case the government, assisted by other stakeholders. The future may point to the possibility of this happening but it has not been the case in the last few years.

In the course of this first stage of the research work the WASHCost team tried to obtain expenditure data (from the past two years of 2006 and 2007) from the main actors (DAR, DAS, including from a few Donors (e.g. ASNANI)) to ascertain the level of harmonization or lack of it as well as disaggregation but it proved to be fruitless in the short term. An assessment of similar attempts or exercises (Sector Expenditure

Reviews on Agriculture, Education and Health) done in the past shows that this is a difficult task as there are serious data deficiencies, including inconsistencies between the budget execution data of the *Conta Geral do Estado* produced by MF and the data on expenditure captured by each of the budget executors, who at present work separately. It is suggested that as part of the WASHCost Project a standalone Rural Water and Sanitation Subsector Expenditure Review be commissioned and conducted shortly.

4.1.2 DONORS

Donors use a combination of funding mechanisms that range from fully non-aligned to fully aligned with the government procedures.

A considerable number of big donors have been moving towards alignment and harmonization and increased adoption of budget support, which is seen by many as a way of increasing aid effectiveness. It is estimated that budget support accounts today for some 26% of total aid (more than 70% for water sector). In the overall economy of that total 16% is provided through common funds and 48% via projects. It is also estimated that two-thirds of the country's aid stays outside the system and is channelled directly to line ministries, provinces and districts as sector funds or under traditional project modalities.

In trying to meet this wide range of funding modalities the government is known to be managing more than 1,000[42] bank accounts and of having received 143 donor missions in 2004, excluding those from the World Bank (Menocal and Sarah 2006: 8-9)[43]. This points to a situation where donors still have limitations to embark on harmonization and alignment, which seem to be informed by a multitude of reasons such as: (a) loan and credit requirements; (b) differing financial management standards; (c) present commitments to project/programmatic funding; (d) agency policies and historical practices; (e) concerns about funds being misused due to weak capacity in public financial management[44]; (f) the use of resources to meet interests outside the main priorities including corrupt misappropriations. In both government and donors there are those who still believe that in the specific case of Mozambique project aid might be more appropriate, as it imposes fewer administrative demands on government, reaches targeted populations and keeps donors in touch with realities on the ground. Off-budget allocation of foreign aid remains very high.

[42] There are indications that, with the introduction of SISTAFE, this problem of bank accounts is gradually dissolving.
[43] Menocal, A.R. and S. Mulley. 2006. Learning from experience? A review of recipient government efforts to manage donor relations and improve the quality of aid. Overseas Development Institute.
[44] Budget execution for external funds continues to be low.

The most recent evaluations[45] in the water sector uncover that donors continue to plan and prepare projects at department level creating obstacles to policy mainstreaming, coherent investment planning and flow of information and data. The sector is still executing more than 20 large scale projects with more than 10 cooperating partners. The end result is that flow of funds from central to provincial and to district level remains unclear. It is beyond doubt that there is no consistency in the budget and spending figures in the water sector at provincial level.

In the final analysis it can be said that although there has been considerable progress over the last three to four years towards harmonization between donors this remains still very weak. This again would militate in favour of conducting a Water Sector Expenditure Review as part of the WASHCost Project in order to establish a baseline for future interventions.

4.1.3 NGOs

NGOs and CBOs, national and international, have been the most difficult to characterize in terms of their budget planning, including budget forecast for themselves and for other stakeholders, budget execution and monitoring. In the same way as the government most of them are considerably dependent from other internal and external entities. This may explain that not all of them are in position of adequately using solid medium term planning instruments and that at times become unpredictable. However, has already mentioned due to their close proximity with the beneficiaries and representation in district and provincial “think tanks” they also play a crucial role in the identification of rural water supply and sanitation interventions as well as in the planning and monitoring and evaluation of projects and programs.

4.1.4 Beneficiaries

There are two main categories of water users in rural and peri-urban areas. One of the categories is made of the typical rural people who mainly use wells with or without hand pumps and those living in towns or their surroundings that use wells, standpipes or different types of house connections provided by public and private entities.

In the typical rural areas the system in place is trying to get the communities and water supply beneficiaries to make two major kinds of contributions, namely: (i) one emblematic contribution to cover the cost of water point installation; and (ii) permanent contributions in money and/or in kind and active involvement of the beneficiaries for the operation and maintenance of the water points after hand over. The average amount

[45] Woersem; B. et al (2007) – Country Report Mozambique IOB Evaluation Water Sector, Version 10 July 2007

for the first contribution stands at MZM 2,500.00 (US$ 100.00), which approximately corresponds to around 2% of the total investment costs for the installation of wells with hand pumps (Afridev). This level of contribution is recommended in MIPAR. Operation and maintenance costs vary from source to source and depend on the specific conditions around each source. In line with the water policy and MIPAR these contributions are meant to reinforce the demand driven and the cost recovery principles although it is acknowledged that in many cases and due to the way in which water points are planned and developed this objective is largely not attained. There is enough evidence to the effect that a lot of efforts are still needed to plan and install water points in a way that promotes stronger ownership of the assets and the overall processes by the communities. As a result a large number of communities fail to collect enough money to cover either the first payment or to put together the resources needed for proper operation and maintenance. At times the resources are made available but only a limited number of people contribute. Each community has its own system to make money collections, to integrate in kind contributions, make records, etc. The systems are usually poor and have little or no consistency[46].

The users of public wells and standpipes in towns either get their water free of charge or against a small fee (MZM.3.50 per 20l in average). Those with house connections are required to pay a monthly fixed fee, irrespectively of the amount of water consumed in the period. Most of the towns in Mozambique do not have water meters and a certain number does not even have a system to collect water fees and consumers simply do not pay for water. The absence of standard national or provincial procedures to deal with this component of water supply in around 68 peri-urban towns across the country tells a lot about the efforts that are still needed to materialize the cost recovery principle foreseen in the water policy. Private operators in small towns charge a fee for the water they provide. This is also poorly regulated and to a great extent is left to market forces and dynamics (supply and demand).

In general sanitation costs are borne by individual households in the purchase, installation, operation and maintenance of all the components that form the various types of latrines currently being used in the rural and peri-urban areas. In the past part of the materials (e.g. slabs, cement, etc.) were subsidized but in more recent times this

[46] According to WaterAid staff member in Mozambique", there is evidence from some work done in Niassa, that when this payment is directly linked to a spare parts kit, as opposed to % of the water point cost, then the community understands the concept more clearly and contributions come in more easily. This has the added advantage of linking the contributions to and sustainability issues.

only happens where there is a specific project providing these subsidies, otherwise the beneficiaries have to cover all the costs. Sanitation costs can be seen in Table 6, above. Overall sanitation programs follow a course that is significantly more difficult to describe.

4.1.5 PRIVATE SECTOR

There are a significant number of private sector operators in rural water supply providing different kinds of goods and services such as contractors for drilling and construction and maintenance operations, consultants for studies, supervision of works, facilitation of community participation and involvement, suppliers of water, equipment, parts, consumables, etc. They are represented by micro, small, medium and large size enterprises and they also use a wide variety of technologies, which may explain that there are no standard prices for the goods and services that they provide. A typical example that is given for the level of disparity of prices is that of Afridev Hand Pump whose prices vary from MZM 17,000.00 (around US$ 708.00) to MZM 28,000.00 (US$ 1,166.00) per full unit. This is said to be also associated with the quality of the pumps and country of origin of the equipment whereby the lowest price corresponds to lower quality and allegedly shorter durability. The same goes for drilling and other services, equipments and parts. The uniformity of costs and technologies are still far from being achieved. The WASHCost team managed to obtain some of the prices from a few sources (e.g. project/program and tender documents (bid offers), window shop displayed prices, price lists, interviews, etc.). There is also a regional variation of prices, with each province having its own cost structure. This is strongly linked to the national structure of prices where most commodities, including petrol vary across the country. In addition to costs provided in tables 5 and 6 series of prices for different water and sanitation items can be seen in Annex 6.

But even accepting that in a free market economy it may be counterproductive to over regulate these aspects, in a sector that is highly subsidized by the government and its development partners it seems to make sense that a certain degree of regulation should be exercised. This should be done on the basis of solid knowledge about value for money informed by research and other forms of building knowledge. Water supply and sanitation, particularly the pro poor component of it cannot be fully open to the laws of supply and demand typical of the free market economy. The tendering processes currently being enforced (Decree 54/2005) may not be enough to guarantee the adherence to this value for money principle.

5 OPPORTUNITIES AND CONSTRAINTS

As mentioned the National Rural Water Supply and Sanitation Program (NRWSSP) for the period 2009-2015 has already been formulated and preparations are underway to implement it starting from next year (2009), which will be the pilot year. An important contribution for the formulation of the program was the first Medium Term Expenditure Review (MTER/CFMP) for the water and sanitation sector conducted in 2007, covering the period 2008-2010. The forecast of financial resources to be mobilized and spent over that period was done and the results were used to feed into the National Water Supply and Sanitation Strategy including its rural subcomponent for the period under consideration. PARPA II and MDG objectives and targets were rolled out against the projections of resources and it is now possible to have a clearer picture of what can be achieved in 2008-2010 and at what cost. The financial situation for the year 2011, which coincides with the first phase of the RWSS, is still in the process of being worked out.

The most relevant actors in rural water supply and sanitation have made their commitments known and this has made it possible to formulate the above-mentioned program which is seen as a paramount opportunity to test the Sector Wide Approach in the water and sanitation sector, particularly in its rural subcomponent. A few opportunities and constraints for the WASHCost project associated with this program are analysed below.

5.1 THE PLANNED SECTOR WIDE APPROACH (SWAP) IN THE RWSS SUB-SECTOR

The program is divided into two phases where the first Phase (2009-2011) is estimated to absorb USD 196.7 million coming from four main sources, namely: (i) USD 31.1 million (16%) from the Government of Mozambique; (ii) USD 120.9 million (61%) from external resources; (iii) USD 7.7 million (4%) from small NGOs; and (iv) USD 10.4 million (5%) from beneficiaries. There is still a funding gap of USD 26.8 million (14%) which is expected to be a subject of negotiations between the Government and its current and potential development partners. The existing picture was developed after a series of exercises including the preparation of the 2008-2010 CFMP and the formulation of the RWSS Program. The later is an ongoing process.

For the five main actors (government, donors, NGO/CBO, private sector and the beneficiaries) to be able to work together and in view of the constraints that have already been described three basic principles have been established and will be pursued in the short to medium term:

d) far-reaching capacity building to support decentralized planning, management and monitoring of RWSS facilities;

e) promoting and supporting common planning, reporting and monitoring systems; and

f) promoting the increased use of national planning, budgeting, financial management, procurement and monitoring systems in the sub-sector.

In addition to bringing all the stakeholders to act increasingly on plan and on budget the objectives of promoting strategic priorities, maintaining fiscal discipline and delivering value for money occupy a central position in the entire program and processes. Figure 13 presents how the linkages among the various stakeholders and how flow of funds is expected to operate under SWAP. It can be seen that even though most actors will be fostering commonly agreed goals and funding mechanisms a certain level of off budget interventions will continue to exist.

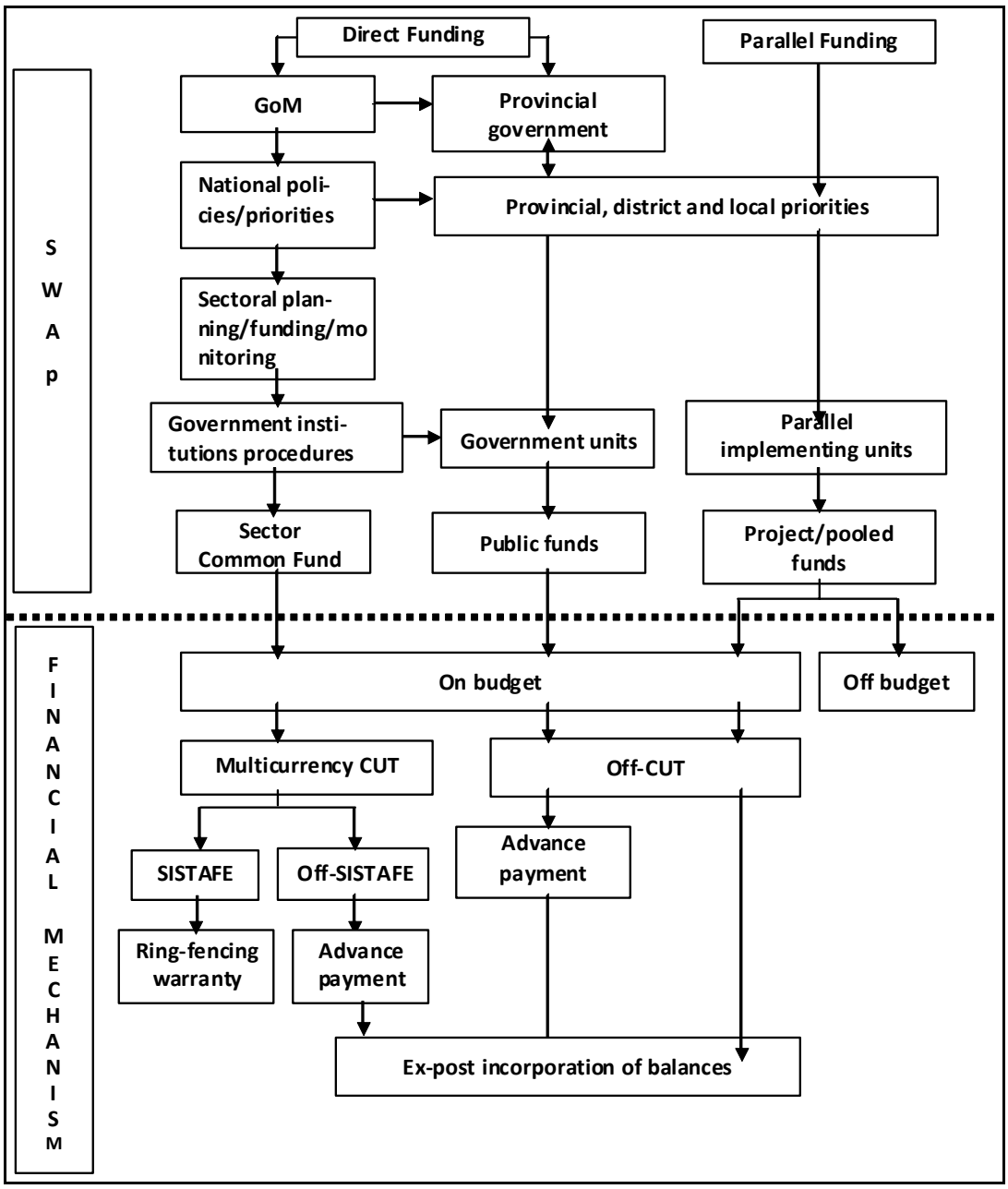

FIGURE 13: Swap Linkages and Flow of Funds
(Source: NRWSSP, 2008)

Progressively the increased use of national policies, systems and standards for planning, financial management, procurement, monitoring and reporting can be expected to facilitate the tracking of resources throughout all the phases of rural water supply and sanitation cycle. This will offer a great opportunity for the WASHCost project to deepen its WASH cost analysis process, including the disaggregation of those costs.

To be successful reforms need a strong platform of information sharing and analysis that enables the integration of new knowledge into the planning, implementation and monitoring cycle. Information, when used timely and concisely, reduces risks and minimizes cost in rural water and sanitation programs enabling the managers to identify and estimates the cost of failure in key aspects of the program. The NRWSSP relies on a set of databases that will store and enable processing of relevant information during the implementation that feeds in to the cycle during its implementation.

For the water and sanitation sector DNA is already in the process of implementing a meta-database SINAS (National Water and Sanitation Information System), information system for the entire water sector, which includes urban water supply and sanitation and water resources management. Most of the initiatives at different departments and cooperating institutions have to take cognisance of SINAS in order to facilitate smooth integration of data obtained or generated outside their own databases.

WASHCost database and data collection systems will benefit from knowing the structure proposed in SINAS.

5.2 Issues to be Addressed for an Effective Unit Cost Analysis

In addition to supporting the accomplishment of the various RWSSP targets, systems and procedures the WASHCost project as such will try to derive maximum benefit from the planned developments. These include[47]:

1. **Increased coverage**: a more determined pursuit of relevant MDGs and reduction in gaps and imbalances in RWSS coverage between and within provinces and districts, including the provision of 7,700 new or rehabilitated water points and 160,000 improved sanitation facilities. This will go hand in hand with improved databases including geographical information of the distribution of the existing facilities and those to be established;
2. **Increased decentralization and deconcentration**: with a significant proportion of planning and implementation being transferred to the provinces and districts, including the local communities and other actors at the local level. Hopefully, over time this will translate into turning the provinces (DASs) districts (SDPIs

[47] Taken from the RWSS Program, October 2008

and SDMASs) into budget execution entities thus lending valuable elements to increased cost awareness and disaggregation;

3. **Harmonization and alignment**: increased use of national policies, systems and standards for planning, financial management, procurement, monitoring and reporting. Of particular importance for RWSSP and for WASHCost in this regard would be the implementation of SISTAFE and CUT (Conta Única do Tesouro), including the implementation of e-SISTAFE. These instruments would link the most relevant water and sanitation budget and financial management actors in an integrated system and make it possible to monitor their plans and expenditure and where necessary to disaggregate the different cost categories in a more coherent and systematic manner;
4. **Program management**: reduction in preparation and processing time for program components and activities as well as reduction in time required for procurement of goods, works and services and increase in capacity for planning, management, supervision and monitoring at all levels. As will further elaborated below capacity building will occupy an important position in the entire process for change; and
5. **Program support**: translated into Increase in quantity and quality of goods and services provided by the private sector; increase in accuracy, use and usefulness of data and information systems and improved market conditions for supply of key goods and services.

It is beyond doubt that if materialized, these developments would constitute a great opportunity for meeting the RWSS strategic objectives and particularly the pro poor and "value for money" approaches to the provision of RWSS related goods and services.

However, there seems to be enough evidence to the effect that a significant number of the above-mentioned developments will require more time to reach the desirable level of stability and maturity that will certainly go beyond the lifespan of the WASHCost Project (around 5 years). Critical issues such as turning DASs, SDPIs and SDMASs into budget execution entities and expanding SISTAF and e-SISTAF coverage and their general functionality are, to a great extent, beyond the control of the water and sanitation sector and its rural subsector. These are aspects directly related with the development of the entire public sector and financial administration reforms, which have been moving at a slower pace than what was expected when the reforms were

initiated in 2001. Extending e-SISTAFE to all the districts, for instance, would, at least, require all the district capitals to be connected to the national power grid or have steady electricity somehow. The extension of the electricity grid to all the district capitals is a target that may take more 2-3 years to achieve (EDM, 2008).

The RWSS Program seems to be overoptimistic about what can be achieved during the first and piloting year, i.e. 2009, but a closer examination of the issues at stake, such the ones mentioned above, would recommend precautionary measures and that WASHCost project considers a few alternative ways of fostering its objectives at the same time that it supports and uses the developments that will be coming out as the RWSS Program evolves. A more solid baseline for unit cost would come from separate studies to be conducted as standalone studies directly commissioned by WASHCost Project and where relevant these would feed into the various pro poor and “value for money” measures considered under RWSS Program. The Rural Water Sector Expenditure Review that as already been suggested could be complemented and/or go hand in hand with other studies and assist in this regard.

6 CAPACITY BUILDING AND TRAINING FOR AN EFFECTIVE UNIT COST ANALYSIS

In spite of all the efforts to establish harmonization and to decentralize, the existing situation is still strongly characterized by:

- The weak capacity of provincial and district government institutions and personnel in formulating and implementing strategic development plans
- The lack of experience of local administration in community participation and in investment activities
- The orientation to centralize decision making that generally characterizes public administration at present, and
- The weakness of the existing legal and institutional framework and experience of the community to influence decentralized decision making.

In such a context building capacity will be the result of combining efforts to increase harmonization and deepening and strengthening decentralization with concerted efforts on the on the job training using live systems, procedures and tools for people to learn by doing as they go.

In view of the main characteristics of the RWSS and its implementing strategy, which consist mainly in making use of existing and planned national systems and procedures water and sanitation personnel at all levels need to be part of the “try and error process” and be integrated into the systems and procedures that will be established as well as be provided with knowledge, attitude and skills and other means to be able to: (i) actively participate in the budgeting process based on government polices, commitments, standards and procedures; (ii) provide accurate and timely accounting, recording and reporting including the use of SISTAFE and e-SISTFE instruments. Led by DNA/DAR/DES government, donor and recognized NGO/CBO would be active in making these common and shared systems and tools work effectively in cost disaggregation throughout the water supply and sanitation cycle.

Communities would also need to be assisted to build strong leadership and to use sound management instruments including adequate book keeping. At the same time that a conducive environment for the private sector would need to be established and capacity built for the actors in this sector to gain interest to be part of the process and

be knowledgeable and positive about the systems and procedures to be created.

Annex 5 (Implementation Readiness Actions) and Annex 7 (Assumptions for Budget Preparation - Phase I – Human Resource Development) of the RWSS Program (October 2008) offer a good basis of the actions that would need to be carried out to establish readiness and human capacity to implement the ambitious SWAP in RWSS, starting from 2009. The capacity building component, in particular, foresees a combination of training modalities ranging from:

(i) formal training (middle level, undergraduate and post graduate studies, to be carried out inside and outside de country);

(ii) non-formal training (short to medium term courses, participation in conferences/workshops and study visits also inside and outside the country); and

(iii) Informal training (certification of local artisans, on the job training, technical assistance).

It is recommended that WASHCost Project espouses and supports the outlined objectives and activities, but as indicated in the previous sub-chapter the project should also develop a few parallel lines of action to meet its specific objectives at the same time that it insists on the adoption of a few more practical elements to capacity building than what seems to be covered under the existing program. It may be too early to provide more details about the meaning of this “practical approach” but there are enough reasons to believe that the establishment of new systems and procedures including producing and making available “user friendly” tools (forms, templates, etc.) for planning, budgeting, monitoring and reporting and tutoring the various actors to be integral part of those may play a more crucial role than any other measures.

Cost analysis in particular would benefit substantially from measures such as:

(a) Making available forms and templates for the personnel at the DNA/DAR/DES, DAS, SDPI, SDMAS to conduct planning, budgeting, monitoring and reporting of their activities. As already mentioned the current situation is characterized by lack of and/or limited number of standard forms and templates to carry out these tasks. Each entity uses its own tools and this makes it difficult if not impossible to harmonize information at the various levels. e.g. SDPI and SDMAS monitoring quarterly reports would

benefit the entire system by being prepared at the back of specific forms that provide data on issues such as (i) number of infrastructures built/rehabilitated in their area; (ii) contractors involved; (iii) unit costs; (iv) community contribution; (v) number of beneficiaries per unit, etc. instead of preparing open reports as is currently the case. After the completion of standardized forms it would be easier to harmonize data at the higher levels and to get more accurate picture of the existing situations. It is suggested that good practices from other sectors such as the "Annual School Surveys" and "Annual School Results" used by the Ministry of Education and Culture be adopted and adapted for the rural water supply and sanitation to provide valuable statistical data including GIS data to be used in the definition of existing situation and for monitoring, evaluation and reporting, including cost analysis;

(b) Provide community money keepers with easy to use forms to record monetary contributions and other contributions from community members and/or develop a better thought system to carry out this task, including subcontracting/identifying local people better prepared to do the book keeping on behalf of the communities;

(c) Provide local artisans and other goods and service providers with simple forms to record and report on the links between their work and financial transactions, etc.

In due course specific aspects related with these tools would need to be developed for the WASHCost project as such and were relevant for them to be integrated into the whole set of systems, procedures and tools to be adopted by the RWSS Program.

7 CONCLUSIONS AND RECOMMENDATIONS

As seen throughout the report, the cost of water and sanitation is a sum of several cost categories. The most important being (i) Capital investments in fixed assets (CapEX); (ii) Operating and minor maintenance expenditures (OPEX); (iii) Capital maintenance expenditure (CAPManEX); (iv) Support costs (direct and indirect); (v) Cost of capital (WASHCost, 2008). Then there are a series of other indirect costs, including the cost of not having access to these services which have to do with aspects such as time spent to access water supply and sanitation due to distance, cost, competition between water and other basic needs, and other obstacles that may force people to be prevented and/or prevent themselves from having access to those goods and services. In most cases these translated into the worsening of the people's living standards.

The planning, budgeting and budget execution and reporting systems and mechanisms that are currently being used in Mozambique imply that most of the costs are aggregated and as such they are of limited use for decision making processes.

Delivering value for money is strongly associated with sound knowledge of all cost categories and sub categories in order for them to be applied to meet the pro poor water supply and sanitation in the implementation of strategic priorities. The knowledge covers important areas of the subsector such as (i) implementation structure of each program; (ii) range of technological options that are available and can be used in a specific setting; (iii) socio-economic environment; (iv) market size or work continuity; (v) specifications in use; (vi) environmental settings or hydro geological settings.

The country is still at its early stage of adopting a more consistent system of planning and budgeting as well as monitoring and reporting in the entire water supply and sanitation cycle. This explains that data is not readily available to meet the above-mentioned objectives.

The planned adoption of the sector wide approach (SWAP) to water supply and sanitation, including its rural subsector and the subsequent formulation of the National Rural Water Supply and Sanitation Program (NRWSSP) for the period 2009-2015 is expected to provide the basis for reversing the prevailing trend. The piloting year (2009) and the years that will follow will provide the necessary experience for making informed decisions regarding transition to budget support in the sub-sector.

There will be increased harmonization and strengthening of planning and budgeting

instruments and increased coherence in the pursuit of unified strategies, plans and a budget steered by the government, assisted by other stakeholders.

The Program offers a series of opportunities and challenges for a better structured WASHCost analysis.

It is suggested that WASHCost should be supporting the accomplishment of the various RWSSP targets, systems and procedures and try to derive maximum benefit from the planned developments. However, it is also acknowledged that most of the planned developments will require more time to reach the desirable level of stability and maturity that will go beyond the lifespan of the WASHCost Project. Therefore it is strongly recommended that at the same time that WASHCost project supports and uses the outcomes of the planned developments it considers a few alternative ways of fostering its objectives by conducting specific separate studies and analyses directly commissioned by WASHCost Project. Where relevant these would feed into the various pro poor and "value for money" measures considered under RWSS Program, but at the same time they would meet short term and discreet objectives of the WASHCost Project. In addition to the planned institutional changes by adopting professed principles of decentralization/deconcentration, unified planning, budgeting and budget execution and reporting systems (e.g. SISTAFE and e-SISTAFE), cost analysis will rely on solid capacity building of the people at the various levels that will be active in the process.

It is recommended that WASHCost Project espouses and supports most of the plans and activities foreseen under RWSSP at the same time that it is suggested that the project should also develop a few parallel lines of action to meet its specific objectives. The focus should be creating capacity and a positive environment for the adoption of a few more practical elements to capacity building than what seems to be covered under the existing program. The production and making available of "user friendly" tools (forms, templates, etc.) for planning, budgeting, monitoring and reporting and tutoring of the various actors to be integral part of better cost analysis systems and procedures, should be actively pursued. These include measures such as:

(e) Conducting a water and sanitation sector expenditure analysis including the analysis of its rural subsector. By looking systematically at how the mobilization of money, allocation and expenditure has been working in the sector in the past (e.g. in the past 10-15 years) this would assist in

establishing a solid baseline to be used throughout the WASHCost Project and RWSSP lifespan to monitor and evaluate progress;

(f) Making available forms and templates for the personnel at the DNA/DAR/DES, DAS, SDPI, SDMAS to conduct planning, budgeting, monitoring and reporting of their activities. This would be aimed at providing a number of standard forms and templates to carry out these tasks and consequently to make it easier to harmonize information at the various levels. The forms and templates would be designed to make it easy for the entities at the local level to provide data on (i) number of infrastructures built/rehabilitated; (ii) contractors; (iii) unit costs; (iv) community contribution; (v) number of beneficiaries per facility, etc. Good practices from other sectors such as can be the cases of education and health should be adopted and adapted for the rural water supply and sanitation to provide valuable statistical data including geographical information to be used in the definition of existing situation and for monitoring, evaluation and reporting, including cost analysis;

(g) Provide community book keepers with easy to use forms to record monetary contributions and other contributions from community members. For both WASHCost and NWSSP it is also suggested that other alternatives to improve community book keeping be examined such as subcontracting/identifying local people better prepared to do the book keeping on behalf of the communities;

(h) Provide local artisans and other goods and service providers with simple forms to record and report on the links between their work and financial transactions, etc.

In summary in addition to recommending a close collaboration between WASHCost and NWSSP it is also recommended that the two sides find creative ways of complementing each other and avoid duplication in areas of common interest, particularly cost disaggregation.

The GPC initiative National Water and Sanitation Information System (SINAS) provides a concrete venue to embedding some of the WASHCost project initiatives and actions

foreseen in the coming years. WASHCost should work closely with DNA-GPC to contribute with valuable tools and inputs to the development of SINAS in a manner that it supports planning, monitoring and implementation of sustainable WASH services in Mozambique.

Overall WASHCost data and information should be seen in a context of multiple actors that influence or are influenced by decisions in the Water and Sanitation subsector. The MPD and MF are fundamental partners in the process of increasing the use of WAShCost information in better planning and implementation of government programmes. For example the development of Guidelines and Planning tools should be done conjunctly or at least in strict cooperation with these ministries in order to avoid confusion in use of terminology. A good knowledge of different cost categories and the links with provision of services would enable the decision makers to evaluate the impacts of budget cuts and relocation vis a vis the sustainability of WASH services.

7.1 RECOMMENDATIONS ON RESEARCH PLAN

Based on the review presented in this documents the team has devised key aspects to be taken into consideration during the development of the research protocol that will guide the future work of WASHCost project in the coming 5 years. The following suggestions are very preliminary and should be further detailed in specific project research protocols.

1. Collection and analysis of CAPex data is relatively ease, therefore the project should initially focus on collecting and analysing these costs, While doing this the objective should be to create tools that will enable the actors to separate from the overall costs that are not strictly CAPex as per the definitions provided in this document. Following this the project can concentrate more on CAPManEX and support costs, of which considerably less information is currently present
2. Cost analyses of rural water supply needs to focus initially on the main technologies. These are: Mechanically drilled borehole equipped with Afridev and hand dug wells. Other technologies such as springs, rain water harvesting, very deep wells are relatively marginal in the country and have little impact in strategic budgeting and long term expenditure planning.
3. There is need to arrive at a consensual definition of Peri-urban in order to start

the work of collecting and analysing pertinent data at this important level. Initial discussions point to few possibilities that can be explored in elaborating this definition e.g. (i) based on type/level of technology;(ii) geographic location in relation to urban areas or (iii) management setup of the infrastructure.

4. Cost analyses for sanitation could initially concentrate on slab latrines, and to a lesser margin, VIP latrines

5. The problematic issues related to the cost of hygiene can best be tackled by disaggregation of PEC costs and activities. However, this will not answer the issue in full since some of the activities are carried out in the health sector and not directly linked to water supply provision.

6. Knowledge of Support Cost (direct and indirect) requires a lot of work for example to detail government expenditure (salary, per diems, communication). This requires development of better planning, budgeting and reporting tools that should be analysis based on the existing framework guiding the operations at various levels including the interdependences between departments. Initial information on Support Cost in probable available at program level e.g. ASNANI and UNICEF.

7. Collect data on the usage and fee collection methods, rates of water vendors and public tap stands in order to help develop national or provincial procedures to deal with this component of water supply in peri-urban areas. This aspects also relates to community managed infrastructure that require an analysis of current systems used to record the expenditures and contribution.

The research protocols to be developed for data collection and analysis for different components can include the methods identified in the table below:

TABLE 9 Data collection methods for different cost categories

Terminology	Recommended best source and methods
Capital investments in fixed assets (CapEX)	Existing literature of proposals and evaluations at Provincial and national level and NGOs, request quotations and price lists. This costs can also be obtained from running programs
Operating and minor maintenance expenditures (OPEX)	Existing Community books, PSAA operators, provincial evaluations. Interviews with Water committees, spare part vendors or Pilot Studies.

Terminology	Recommended best source and methods
Capital maintenance expenditure (CAPManEX)	Identify units and request quotations and price list. Verify existing rehabilitation plans at national and regional levels of PSAA. Extensive survey at different department of bid documents. The study could also select few departments and follow-up closely the different stages of the process of procuring and implementing projects for service provision.
Support costs (direct and indirect)	Interviews with district, provincial and national government agencies. Ideally, sector expenditure study. Develop and monitor implementation of data collection tools including tutoring.
Cost of capital	Interview with private operators, private sectors, banks and finance institutions. Review the BoQ and the invoices approved for payment against field technical reports.

ANNOTATED BIOGRAPHY

Provided as separate document

ANNEXES

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ANNEX 2 – NGO's in the Water and Sanitation Sector

ANNEX 3 – State Budget Classifiers

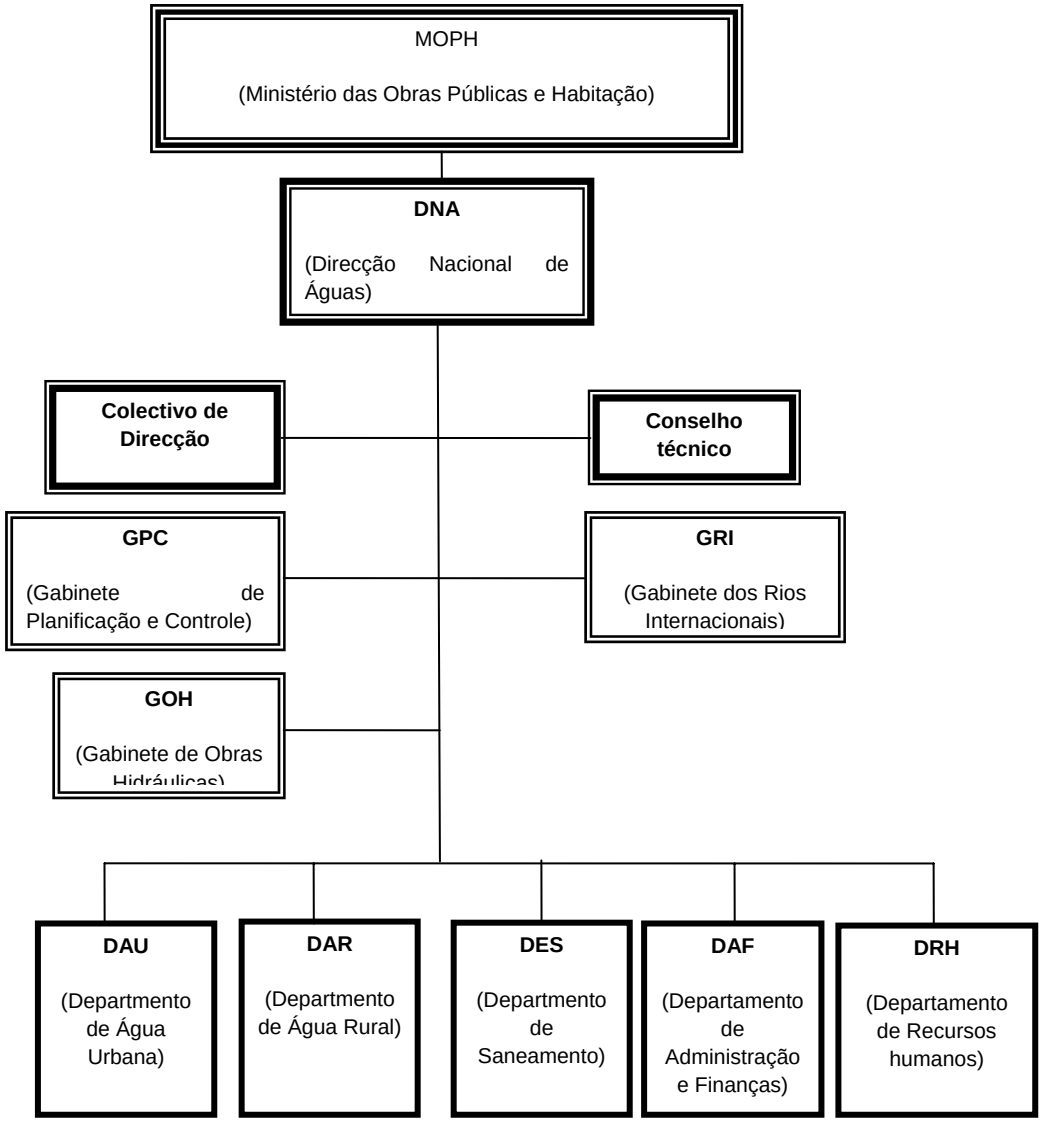
ANNEX 4 – Mozambique's Budget Planning and Monitoring Cycle

ANNEX 5 – Drilling Costs by PROVINCE

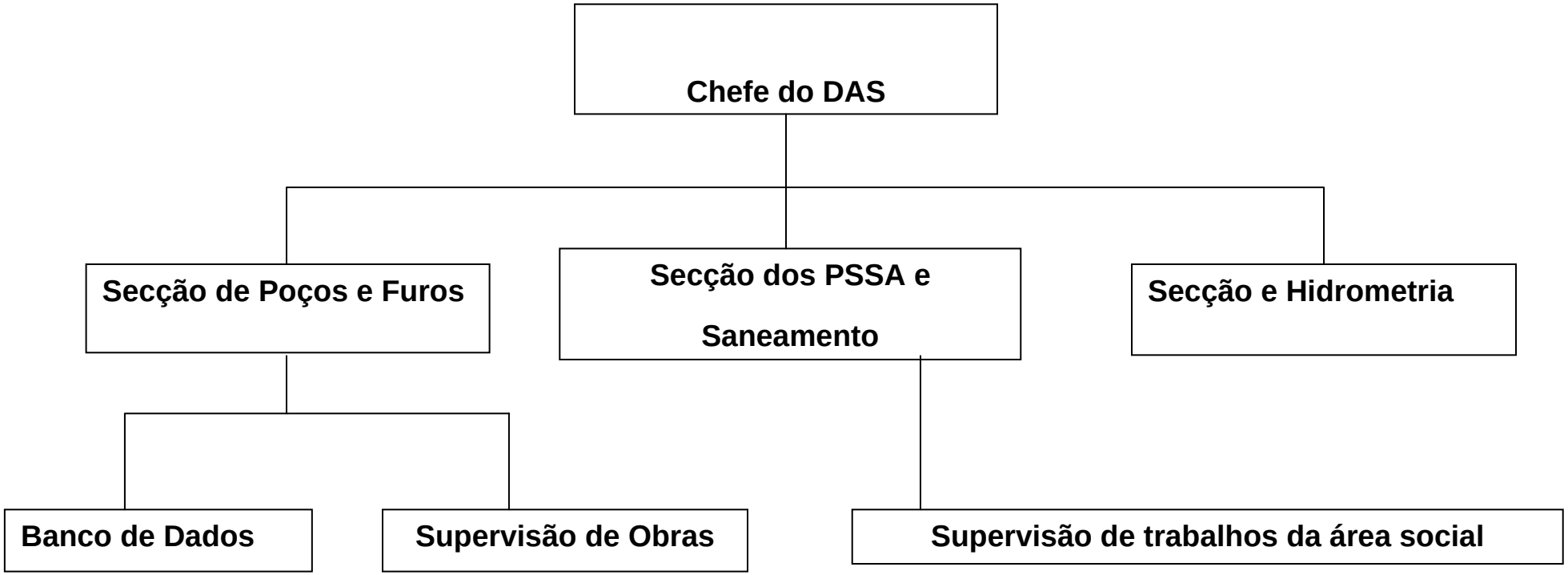
ANNEX 6 – Borehole Construction Costs

ANNEX 7 – Estimated Values of Spare Parts Necessary for the Maintenance and Repair of an AfriDev Pump

ANNEX 1: DNA/DAS ORGANIZATIONAL CHART



DAS Organizational Chart – The Case of Nampula Province



ANNEX 2: NGOS IN THE WATER AND SANITATION SECTOR

Organização	Nome	Função	Endereço	Cidade
ActionAid	Alberto Silva	Director Nacional	Rua Comandante Joao Belo, 208	Maputo
ActionAid	Nacima Bano Figia	Coordenadora dos Direitos da Mulher e da Criança	Rua Comandante Joao Belo, 208	Maputo
ActionAid	Ana Luisa Mulhovo	Oficial de Programas	Rua Comandante Joao Belo, 208	Maputo
ADRA	Jair Parada	Country Director (Interim)	Av. Eduardo Mondlane 2091 CP 1633	Maputo
Aga Khan Foundation	Karim Merali	Director Executivo	Edifício Sua Alteza Aga Khan, Av. Alberto Luthuli, 739	Maputo
Amurt	Melchior Parinas	Project Director	Bairro 4 de Inhamissa CP 55	Xai-Xai, Gaza
APRODES	Reinaldo Ernesto			Chimoio, Manica
ASADEC	Henriques Verónica Henriques	Coordenador	Estrada Nacional No. 6, 15o Bairro, Casa No. 1108, Passagem de nível	Beira, Sofala
Associação Kindlimuka	Arlindo Fernandes	Presidente	Rua Eng. Vasconcelos Sá, 82	Maputo
Associação Kindlimuka	Simião Vasco	Coordenador do Programa das Escolas	Rua Eng. Vasconcelos Sá, 82	Maputo
CARE Moçambique	Barbara Jackson	Coordenadora Nacional	Av. Mártires da Mueda, 596	Maputo
Concern Worldwide	Angela O'Neill de Guilio	Directora Regional	Rua Fernão Melo e Castro, 124, Bairro Sommerschield	Maputo
Concern Worldwide	Remko Berkhout	Deputy Country Director	Rua Fernão Melo e Castro, 124, Bairro Sommerschield	Maputo
Conselho Cristão de Moçambique	Rev. Pastor Dinis Matsolo	Secretário Geral	Rua de Mtomoni, 57	Maputo
Conselho Nacional da Juventude	Dr. Eduardo Munhequete	Presidente	Av. 25 de Setembro, 916-7o andar	Maputo
Cruz Vermelha de Moçambique	Fernanda Texeira	Secretária Geral	Agostinho Neto, 284 CP 2986	
Fórum Mulher	Isabel Casimiro	Presidente	Rua Pereira do Lago, 147	Maputo
Fundação para o Desenvolvimento da Comunidade (FDC)	Narciso Matos	Director Executivo	Av. 25 de Setembro, Edifício Times Square	Maputo
Fundação para o Desenvolvimento da Comunidade (FDC)	Albino Francisco	Oficial de Programas	Av. 25 de Setembro, Edifício Times Square	Maputo
GESOM	Sérgio Silva	Coordenador	Rua de Barué No. 835	Chimoio, Manica
HAI - Health Alliance International	Pablo Montoya	Director Nacional	Av. Emília Dausse, 17-1o andar	Beira, Sofala
HAI - Health Alliance International	Wendy Johnson	Coordenadora Nacional	C/o HAI - Maputo	Chimoio, Manica

Organização	Nome	Função	Endereço	Cidade
Health Alliance International (HAI)	Kenneth Gimbel-Sherr	Director Nacional	Av. Emília Dausse, 17-1o andar	Maputo
Helvetas	Alberto Burgi	Coordenador	Rua Dom Carlos, 53	Maputo
Lutheran World Federation (LWF)	Lucas Owuor-Omondi	Coordenador Nacional	Rua Dar Es Salaam No. 296	Maputo
Madzi Saneamento	Aquimo Nota			Beira, Sofala
Magariro	Joaquim Oliveira			Chimoio, Manica
Medicus Mundi	Ivan Zahinos Ruiz	Representante	Av. Eduardo Mondlane, 677, r/c	Maputo
Medicus Mundi Catalunya, Projecto Cabo Delgado Sul	Dra. Pepa Sardanés Albert	Coordenadora	C/o Av. Eduardo Mondlane, No. 677 - 3o Esq.	Pemba, Cabo Delgado
MONASO	Ana David	Coordenadora	Rua Comandante Augusto Cardoso, 34	Maputo
MSF Suíça	Patrick Wieland	Director	Av. Agostinho Neto, 1007	Maputo
MSF-Bélgica	Alain Kassa	Coordenador	Av. Agostinho Neto, 1024	Maputo
MSF-Bélgica	Dr. Marc Biot	Coordenador Médico	Av. Agostinho Neto, 1024	Maputo
Pambery	Emidio Paulino			Chimoio, Manica
Samaritan Internation Purse (SPIR)	Paul Gimson	Director	Rua Rui Pina, 61	Maputo
Samaritan Internation Purse (SPIR)	Joseph Lai	Director Nacional	Rua 1.301 Sommerschield No. 35	Maputo
Save the Children	John Grabowski	Country Director	Rua da Tchamba, 398,	Maputo
SNV	Quirin Laumans	CountryDirector Mozambique and Zimbabwe	Av. Julius Nyerere 1339	Maputo
WaterAid	Rosália Mabica	Representante Residente	Av. Paulo Samuel Kankhomba, 1821	Maputo
World Relief	Samuel Moses Grottis	Director Nacional	Rua D. João III, 90	Maputo
World Vision International	Vacant	Director Nacional	Av. Agostinho Neto, 620	Maputo

B

ANNEX 3: State budget classifiers

STATE BUDGET CLASSIFIERS
• ECONOMIC CLASSIFICATION BY REVENUE Revenue, donations, loans • ECONOMIC CLASSIFICATION BY EXPENDITURE • ORGANIC CLASSIFICATION State organs • FUNCTIONAL CLASSIFICATION Administrative functions and public services • CLASSIFICATION BY PROGRAMS Public service programs • TERRITORIAL CLASSIFICATION Country territorial areas • CLASSIFICATION BY FINANCIAL SOURCES Entities funding OE • CLASSIFICATION BY CURRENCIES

Source: DNPO, 2004

A

ANNEX 4: Mozambique's budget planning and monitoring cycle

Month/Period of the Year	Activities
January	Review of PES of Year (n-1) prepared by the sectors and submitted to MPD by the 31st.
	Year (n-1) budget execution report prepared by MPD
February	Review of PES and Budget Execution Report submitted to the Parliament until the 15th
April	Districts start to prepare PES and State Budget (OE) for Year (n+1)
May	Districts continue to prepare Year (n+1) PES
June	Year (n+1) PES and OE prepared by the sectors, provinces and other state organs
July	Year (n+1) PES and OE submitted to the MPD and MF until the 31st
	Preparation of PES six month assessment reports of Year (n)
August	PES and budget execution six month assessment reports of Year (n) submitted to the Cabinet and the Parliament until the 15th
	PES (National and Provincial) of Year (n+1) prepared by MPD and MF
September	PES and OE of Year (n+1) submitted to the Economic Council and later on to the Cabinet, until the 15th and subsequently to the Parliament until 30th
December	Year (n+1) PES and OE debated and approved by the Parliament until the 31st

ANNEX 5: Drilling costs by province

Province	Price in USD	Price in MZM
Maputo	6,251	156,275
Gaza	7,890	197,250
Inhambane	8,358	208,950
Manica	6,346	158,650
Sofala	6,493	162,325
Tete	4,915	122,875
Zambezia	5,032	125,800
Nampula	6,191	154,775
Cabo Delgado	6,146	153,650
Niassa	6,312	157,800

Source: WSP, April 2006, Drilling sector assessment; price include mobilization, geophysical investigation, drilling, concrete work and pump (exchange rate 1USD =25MZM – April 2006)

C

ANNEX 6: Borehole construction costs

Item	Description	Cost in US$
1	Fuel for drilling	1,000
	Labour	225
	Surveyor	150
	Casing material	50
	SUB – TOTAL 1	**1,425**
2	Casing	675
	Pumping test	100
	Water quality analyse	30
	Concrete works	220
	Report, GPS, etc.	55
	SUB – TOTAL 2	**1,080**
3	Mobilization	500
	Pump and installation	1,500
	Investigation	300
	Fixed cost	1,200
	SUB-TOTAL 3	**3,500**
	TOTAL	**6,005**

Source: WSP Drilling sector assessment, april 2006
(exchange rate 1USD =25MZM – April 2006)

PLANNING COST FOR WATER SUPPLY INFRASTRUCTURE PROVISION

	2005-2007	2008-2010	2011-2015	Total
Boreholes with hand pump	20,833.5	32,831.9	60,892.5	114,557.9
Dug wells and protected springs	4,687.5	7,387.1	13,700.8	25,775.4
Sub-total 1	25,521.0	40,219.0	74,593.3	140,333.3
Small piped water systems (70 @ USD 600,000)	10,800.0	10,800.0	20,400.0	42,000.0
Small piped water systems (70 @ USD 500,000)	8,750.0	8,750.00	17,500.0	35,000.0
Sub-total 2	19,550.0	19,550.0	37,900.0	77,000.0
Sub-total 3 (= 1 + 2)	45,071.0	59,769.0	112,493.3	217,333.3
Social marketing costs (30% of Sub-total 3)	13,521.3	17,930.7	33,748.0	65,200.0
Program management costs (10% of Sub-total 3)	4,507.1	5,976.9	11,249.3	21,733.3
Institutional costs (10% of Sub-total 3)	4,507.1	5,976.9	11,249.3	21,733.3
Total	67,606.5	89,653.5	168,739.9	325,999.9

Source: RWSSI - DNA 2005

D

Typical Bill of Quantities for Pricing Borehole of Official Bids

Item	Description	Un	Quant	Unit Price MT	Total Cost MT
1	**Preliminary work and generalities**				
1.1	Mobilization of personal and equipment for the duration of works and site establishment	VG			
1.2	Preparation of report	un			
2	**Constructions of X number of boreholes according to specifications**				
2.1	Mobilization and demobilization of the rig, considering distance between points of less than 30 km	un			
2.2	Drilling of soft rock (sand, clays etc…), min diameter min. of 165 mm	m			
2.3	Drilling of stiff rock (sandstones, weathered gneiss, weathered granite me etc.) min diameter of 165 mm	m			
2.4	Casing with plain PVC of 100 mm in diameter	m			
2.5	Slotted filter casing of PVC 102 mm of internal diameter filter slots of 0,5mm (2 filters, 6m)	m			
2.6	Bottom casing with 2 m plan PVC (l = 1,5 m per borehole)	m			
2.7	Back filling of the borehole annular space with uniform gravel pack calibrate between 1 - 2.5 mm	m			
2.8	Back filling of the borehole annular space that is cased with plain PVC using clay seal 1 m length	un			
2.9	Backfilling of the annular space where the casing if plain PVC with tout-venant	m			
2.1	Sealing of the top annular space of the borehole with mortar cement (mixture of cement and sand) for the last 5 meters of the borehole .	un			
2.11	Cleaning and development of the borehole for a minimum of 3 and maximum of 6 hours.	un			
2.12	Well pumping test for each of the boreholes according to specifications.	un			
2.13	Constructions of Apron according to specifications with drainage channel. The drawing to be provided by the bidder.	Un			
2.14	Water quality analysis for bacteriological and chemical characterization of the water.	Un			
2.15	Well disinfection	Un			
2.16	Preparation of borehole technical report	Un			
3	Supply and Installation of hand pump type "AFRIDEV", reference SKAT2 of 1998, for 35 m immersion, including coupling and fixing tools and 1st routine repair kit. Printing of borehole identification code.	Un			
4	Construction of protection fence around the borehole according to drawings provided by the bidder.	un			
	SUB TOTAL				
17%	**VAT (17%)**				
	GRAND TOTAL				

E

Unit Costs of Typical Facilities

Description	Unit	Nr. of operational units (2004)	Unit Cost	
			USD	Year
Construction of protected dug well	each	4,085	4,500	2003
Protected spring	each	130	2,600	2002
Construction of borehole with hand pump	each	7,111	10,000	2003
Rehabilitation of borehole with hand pump	each	1,400 approx.	3,125	2004
Rehabilitation of small piped systems up to 10.000 inhabitants	each	30	* 450-500,000	2004
Rehabilitation of small piped systems, 10.000-20.000 inhabitants			* 750,000	2004
Traditional improved latrine	each	?	10-15	1997
State contribution to improved latrine (with use of cement)	each	> 320,000 **	31.50	2004
Social marketing costs - % per water point built	%	-	20% before 10% after	2004
Social marketing costs - % per traditional improved latrine built	%	-	50%	2004
Program management costs - % per unit built	%	-	5-10%	2004
Institutional costs - % per unit built	%	-	5-10%	2005

Notes: * cost including the executive project
** mainly peri-urban.

Source: RWSSI - DNA 2005

F

ANNEX 7: Estimated values of spare parts necessary for the maintenance and repair of an AfriDev hand pump

(it is expected that a pump has a useful life of ten years)

Description	Quantity Per year - ideal estimate (one pump)	Quantity Per year (one pump)	Cost / unit (distributor - Stenaks Maputo)	Estimated cost / unit (in Ibn) + 20% over the Stenaks price	Based on an estimate of 20% Over the Stenaks price: Total /year in ideal conditions (USD)	Total /year in local conditions (USD)
Rod centraliser	1.00	0.07	0.93	1.12	1.12	0.08
Valve bobbin	2.00	0.04	0.83	1.00	1.99	0.04
Pair of bush bearings	2.00	0.26	2.20	2.64	5.28	0.69
U-seal	2.00	0.30	3.03	3.64	7.27	1.09
O-ring	1.00	0.15	0.54	0.65	0.65	0.10
Estimated total annual cost of maintenance of one pump					**16.31**	**1.99**
Piston	0.20	0.26	7.69	9.23	1.85	2.40
Complete foot valve	0.20	0.26	7.69	9.23	1.85	2.40
Rising main centraliser	0.10	0.05	4.40	5.28	0.53	0.26
Stainless steel pump rod	1.00	0.70	45.50	54.60	54.60	38.22
UPVC rising main pipe	0.50	3.70	23.10	27.72	13.86	102.56
Cyliners	0.10	0.20	110.00	132.00	13.20	26.40
Pump head and handle	0.02	0.05	151.25	181.50	3.63	9.08
Rod hanger pin	0.10	0.15	22.22	26.66	2.67	3.95
Fulcrum pin	0.10	0.07	27.50	33.00	3.30	2.44
Pipe unions	1.00	0.80	3.30	3.96	3.96	3.17
Material for pipe repairs	1.00	0.50	19.80	23.76	23.76	11.88
Nylon rope	7.00	2.40	0.54	0.65	4.54	1.56
Total estimated amount for repair of a pump in one year					**123.20**	**202.76**

Source: First National Water Development Project (NWDP 1) – Market Survey of Hand-pumps and Spare Parts in Inhambane – Junho 2000

G

	2005-2007	2008-2010	2011-2015	Total
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Total	67,606.5	89,653.5	168,739.9	325,999.9

Source: Rapid Assessment of Rural Water Supply and Sanitation (RWSS) - Mozambique Requirements for Meeting the MDGs (Final Report, March 2nd, 2005), DNA

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Social marketing costs - % per traditional improved latrine built	%	-	50%	2004
Program management costs - % per unit built	%	-	5-10%	2004
Institutional costs - % per unit built	%	-	5-10%	2005

Notes: * cost including the executive project ** mainly peri-urban.

Sources: Project management and institutional costs: consultant's estimates.

Other costs: DNA/DAR, 4/2/05; DNA/DES, 7/2/05

Quoted from Rapid Assessment of Rural Water Supply and Sanitation (RWSS) - Mozambique Requirements for Meeting the MDGs (Final Report, March 2nd, 2005), DNA