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PRIVATE SECTOR PARTICIPATION IN THE WATER AND SANITATION INDUSTRY IN ZAMBIA: OPPORTUNITIES AND CONSTRAINTS

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DECLARATION

I **IAN NZALI BANDA** do hereby declare that this thesis is entirely the outcome of my own work and that to the best of my knowledge, it has never been presented for a degree at this or any other University. All figures and tables, except for those whose sources have been acknowledged, are original.

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APPROVAL

This dissertation of Ian Nzali Banda is approved as fulfilling the partial requirements for the award of the degree of Master of Engineering in Environmental Engineering by the University of Zambia.

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DEDICATION

In memory of my late father Paul K. Banda whose wise counsel I shall never forget. To my living mother Mukonda-Nthembo Manda Banda who ensured that I remained focused on my School work as a young School-boy.

and

To my dearest wife Anansi, my four children Mukonda-Nthembo, Madalitso, Kamoto and last but not least Msinje (Njunjuna), "I hope this work serves as a good example to all of you"

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DEFINITIONS

Private Sector Participation	"PSP" refers to the involvement of the private sector in some form, at some stage in the delivery of services. It is a general term that is used to cover a wide range of private sector involvement from the service contract, management contract, concession and BOT. It may also include informal sector participation.
Privatisation	This term is used to mean the transfer of ownership to the private sector.
Service delivery	Means producing, treating, distributing and selling of clean water and the charging for, collecting, transferring, treatment and disposing of sewage.
Access to Safe Water Supply	Generally refers to access to potable water obtained from water points not exceeding 250meters in urban areas and 500meters in rural areas with average queuing time of 15 to 30 minutes at the water point.

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ACRONYMS

AHC-MMS	Asset Holding Company Municipal Mining Services
APC	Area Performance Contracts
BCHOD	Brian Colquhoun, Hugh O'Donell and Partners
BOD	Biochemical Oxygen Demand
CWSSP	Community Water Supply and Sanitation Project
CWS	City Water Services
CMMU	Community Management and Monitoring Unit
CSO	Central Statistics Office
CU	Commercial Utility
DAWASA	Dar Es Salaam Water & Sewerage Authority
DISS	Department of Infrastructure and Support Services (of MLGH)
DTT	Divestiture Technical Committee
DWA	Department of Water Affairs (of MEWD)
DWASHE	District Water Sanitation and Health Education
DWSSP	Dar Es Salaam Water Supply and Sanitation Project
EU	European Union
EWURA	Energy and Water Utilities Regulatory Authority
FDI	Foreign Direct Investment
FTWSCF	First Time Water Connection Tariff
GDP	Gross Domestic Product
GNP	Gross National Product
GOT	Government of the United Republic of Tanzania
GOU	Government of Uganda
GRZ	Government of the Republic of Zambia
GTZ	Gesellschaft fur Technische Zusammenarbeit (German Agency for Technical Co-operation)
IBT	Increasing Block Tariff
IDA	International Development Association (of the World Bank)

JICA	Japan International Cooperation Agency
LA	Local Authority
LCC	Lusaka City Council
LWSC	Lusaka Water and Sewerage Company
MAFF	Ministry of Agriculture Food and Fisheries
MEWD	Ministry of Energy and Water Development
MLGH	Ministry of Local Government and Housing
MOFED	Ministry of Finance and Economic Development
MOWLD	Ministry of Livestock and Water Development
NGO	Non Governmental Organisation
NWASCO	National Water and Sanitation Council
N-WASHE	National – Water, Sanitation and Health Education
NWP	National Water Policy
NWSC	National Water and Sewerage Corporation
OIF	Operation and Investment Fund
O & M	Operation and Maintenance
PA	Public Authority
PCU	Programme Co-ordination Unit
PO	Private Operator
PPP	Public-Private Partnership
PPRSC	Presidential Parastatal Sector Reform Commission
PRSP	Poverty Reduction Strategy Paper
PSP	Private Sector Participation
RSU	Water Sector Reform Support Unit
SAUR	Societe d' Amenagement Urbain et Rural
SOE	State Owned Enterprise
SSA	Sub Saharan Africa
SSIP	Small Scale Independent Providers
UFW	Unaccounted For Water
UN	United Nations
UNICEF	United Nations Children's Educational Fund

URWSP	Urban Restructuring and Water Supply Project
UWSS	Urban Water Supply and Sanitation
US ($)	United States Dollar
VAT	Value Added Tax
WASHE	Water Sanitation and Health Education
WEDC	Water Engineering Development Centre
WHO	World Health Organisation
WPC	Water Policy Committee
WSDG	Water Sector Development Group
WSP	Water and Sanitation Program
WSS	Water Supply and Sanitation
ZCCM	Zambia Consolidated Copper Mines
ZMK	Zambian Kwacha

ABSTRACT

Adoption of new mechanisms through which water supply and sanitation services may be provided to communities in Zambia has been undergoing continuous transformations over the last decade. Policy makers and other key stakeholders have been trying to find the most appropriate and self sustaining service delivery mechanism, through which good quality services can be provided to consumers throughout the country. In 1993 the Government of Zambia embarked on a reform process primarily aimed at addressing the many problems associated with water supply and sanitation to communities. Notable outputs of the reform process were; passing of a new National Water Policy, enactment of new legislation, establishment of new institutions and the strengthening of the regulatory framework.

Private Sector Participation (PSP) has prominently emerged as one of the probable ways through which service delivery can be improved in Zambia. This assertion emanates from the widely held notion that, "the private sector can enhance operational efficiency due to their strong adherence to sound commercial principles and good management practices".

The main objective of this study therefore was to, "investigate the appropriateness of PSP service delivery arrangements as a means through which water supply and sanitation services may be rendered in Zambia (the City of Lusaka being the test case) and to identify the associated opportunities and constraints". The main approach centered on evaluating the experiences gained from PSP contracts in water supply and sanitation that are already in existence and using the findings to help formulate a PSP option for Lusaka, Zambia. Three PSP cases were evaluated in this study namely, Kampala-Uganda, Dar Es Salaam-Tanzania and the Copperbelt Province-Zambia (this contract was confined to only the ex-mining areas of the Copperbelt Province).

The main findings revealed that the main problematic issues in Zambia's urban water supply and sanitation service arena are; failure to access capital required for infrastructure rehabilitation in order to stem the many network losses, inadequate capital for network expansion, poor commercial management leading to low revenue collections, overstaffing, financing for effecting improvements to the poor and political interference.

In this study it was determined that these issues were to a large extent addressed in the PSP contract in Uganda and to a lesser extent in the newly incepted PSP contract in Tanzania. Based on the attributes of the many PSP contracts in use world wide, it has been established that initially, a 2 to 3 years duration Performance Based Management Contract, followed by a 7 to 10 years duration Lease Contract (upon successful completion of Management Contract) as the most suitable PSP proposition for Lusaka.

However, haphazard adoption and subsequent implementation of PSP in any form will not bring about the expected results. What is cardinal is that prior to adoption of PSP for any given service area, a well focused, detailed and thoroughly laid out due diligence study ought to be undertaken to establish the merits and or demerits of using PSP. This stems from the position that not all of the problems outlined above are prevalent in all the service areas implying that the solution will vary on a case by case basis. Therefore it can be asserted that PSP is not necessarily a panacea for Zambia's water supply and sanitation sector.

CHAPTER ONE

1. INTRODUCTION

1.1 BACKGROUND

Zambia, situated in Southern Africa, occupies a land area of 752,614 square kilometers. It shares borders with the Democratic Republic of Congo, Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, Namibia and Angola. It is a highly urbanised country with over 50% of its approximately 9,500,000 people living in urban and peri-urban areas and an estimated GDP per capita of US$ 134.00 (GRZ, 1999 and GRZ, 2000a).

In the year 2000, access to safe water supply in Zambia was estimated at 86% for the urban population and 29% for the rural population. For sanitation (i.e. access to proper toilet facilities which refers to those having flush toilet facilities and Ventilated Improved Pit latrines) the estimates were 39% and 2% for urban and rural areas respectively (GRZ 2000a). BCHOD (2003) categorized and summarized the various levels and forms of access as shown on Tables 1.1 and Table 1.2.

Table 1.1: Categories of levels of access to water supply in Zambia

Source of Water Supply	Category
Commercial Utility/ Local Authority	• **Full Access** - In Urban areas with formal planning and housing with direct internal or external water connections per house, with or without waterborne sanitation facilities • **Indirect Adjacent Access** – In Urban areas where people do not have direct connections (or may have been disconnected) and avail themselves of supplies via neighbours, those who share communal taps and those within walking distances or less than 100 meters. • **Other Indirect Access** – In Urban and Peri – urban areas where housing does not provide for direct water connections and distances to communal standpipes or water kiosks exceed 100m but are not less than 2 kilometers. • **Inadequate Access** - As for "Other Indirect Access but at a distance

Source of Water Supply	Category
	exceeding 2 kilometers • **Non- Access** – In Urban or Peri-urban areas where kiosks or non communal standpipes are not available or easily accessible and where use is made of alternative nearby surface or groundwater sources either by default or choice
DWASHE (Clean water)	• **Reasonable Access** – In rural areas at a distance of not more than 2 kilometers from the homestead • **Distant Access** – In rural areas at a distance exceeding 2 kilometers
Other (Untreated)	• **Private Access** – In urban or peri urban areas where householders have their own independent water supplies based on boreholes and wells within their own property. • **Indirect Access** – Where residents obtain water from those with "private access"

Source: Own, assembled using data from the Water Supply and Sanitation Report by BCHOD (2003)

The classification of access as described in Table 1.1, are expressed numerically in Table 1.2.

Table 1.2: Classification of access to Water

TYPE OF WATER	TYPE OF ACCESS	PERCENTAGE BY HOUSING CATEGORY			
		HC/MC	LC	PERI-URBAN	RURAL
Treated	Full access	85-95	75-85	0 to 5	0
	Indirect Adjacent	0	10 to 20	0 to 10	0
Treated	Other Indirect	0	0 to 10	40 to 60	0
	Inadequate	0	0 to 5	15 to 35	0
	Non-access	0	0 to 5	20 to 40	80 to 100
Clean-DWASHE	Reasonable	0	0	0	50 to 80
	Distant	0	0	0	15 to 45
Other	Private	5 to 15	0	0	0 to 5
	Indirect	0 to 5	0 to 10	0	0 to 5

Source: Water Supply and Sanitation Sector Review Report by BCHOD (2003)

LC – Low Cost areas

MC – Medium Cost areas

HC – High Cost areas

DWASHE – District Water Sanitation Health Education

Provision of water supply and sanitation services in Zambia for people living in communal settlements in urban and (to some extent) rural areas, has largely been rendered directly and indirectly by Government. This has been through the Department of Water Affairs (DWA) in the Ministry of Energy and Water Development (MEWD), Engineering Services Departments within the Local Authorities and lately through Commercial Utilities (CU) which are companies wholly owned by the Local Authorities. Over the years however, consumers have experienced a marked and continuous deterioration in the overall quality and level of service delivered due to several socio-economic, technological and political factors as follows;

Socio-economic factors

(a) Poor overall macro-economic performance evidenced by reduced GDP levels and scarcity of capital needed for expansion, improvement and refurbishment of the network physical infrastructure.

(b) Increasing inability by a large proportion of the customer base to afford the services provided.

(c) Rapid urban population growth exacerbated by exceedingly high trends of rural to urban migration, which have led to overloaded networks i.e. serving much larger populations than was originally designed for.

Political factors

(a) A tendency by utility managements and other government dependent service providers to satisfy political rather than commercial objectives.

(b) Inertia by government to ensure usage of fully cost recovering tariffs for services provided by the utility.

(c) Failure by government and quasi government institutions to service debts accrued.

Technological factors

(a) Poor management of the networks due to incompetence and insufficient qualifications of the key managerial and operational staff.

(b) Non adherence to minimum basic maintenance standards.

(c) Usage of inappropriate technology.

In an effort to redress this situation, the Government of the Republic of Zambia (GRZ) embarked on a reform process in 1993 primarily aimed at addressing the problems of water supply and sanitation delivery to communities. An inter-ministerial coordination body called the Programme Coordination Unit (PCU) was established to spearhead this process of reorganising the water supply and sanitation sector. The mandate given to the PCU included undertaking:

1. Sector policy reforms
2. Clarification of sector responsibilities
3. Framework for planning, project development and operation and maintenance
4. Proposals for institutional strengthening

The PCU established a secretariat called the Water Sector Development Group (WSDG). The WSDG in consultation with various stakeholders defined the institutional framework, which was based on seven sector principles adopted by GRZ. The sector principles are as follows:

1. Separation of water resources functions from water supply and sanitation
2. Separation of regulatory and executive functions within the water supply and sanitation sector
3. Devolution of authority to local authorities and private enterprises
4. Achievement of full cost recovery for the water supply and sanitation services (capital recovery, operation and maintenance) through user charges in the long run
5. Human Resources development leading to more efficient institutions

6. Adoption of technology appropriate to local conditions
7. Increased GRZ spending priority and budget spending to the sector

Government in an attempt to rationalize on overhead costs and resources available formed the Water Sector Reform Support Unit (RSU), which replaced the WSDG but still reported to the PCU. The RSU was formed through the merging of the Community Management and Monitoring Unit (CMMU) (an entity established by the Department of Water Affairs (DWA) in the Ministry of Energy and Water Development primarily to carry out an inventory of all rural water points in existence) with the WSDG in 1997. In 1996, a unit called the National Water, Sanitation and Health Education Training and Co-coordinating Team (N-WASHE) was established. The N-WASHE's prime responsibilities were to spearhead the advocacy for integration of the WASHE approach (Water, Sanitation and Health Education) amongst district councils and communities. It was placed under the overall supervision of the newly established RSU in 1997.

The main objective of this approach was to *"promote, integrated development of water, sanitation and health education so as to improve the health impact of water and sanitation interventions, and to promote community management so as to ensure sustainability of services through better financial support and operation and maintenance"* (Nyumbu,1999). Figure 1.1 illustrates the various stages in the formation of the RSU.

One major output of the reform process was the enactment of the Water Supply and Sanitation (WSS) Act No. 28 of 1997. This Act provides for the "*establishment, by local authorities, of water supply and sanitation utilities; to provide for the efficient and sustainable supply of water and sanitation services under the general regulation of the National Water Supply and Sanitation Council and to provide for matters connected and incidental to the foregoing*".

Part III section 9 subsections 1a to 1c of the Act state that, *a local authority may resolve to establish a water supply and sanitation utility as a company under the Companies Act as follows;*

(a) *as a public or private company*

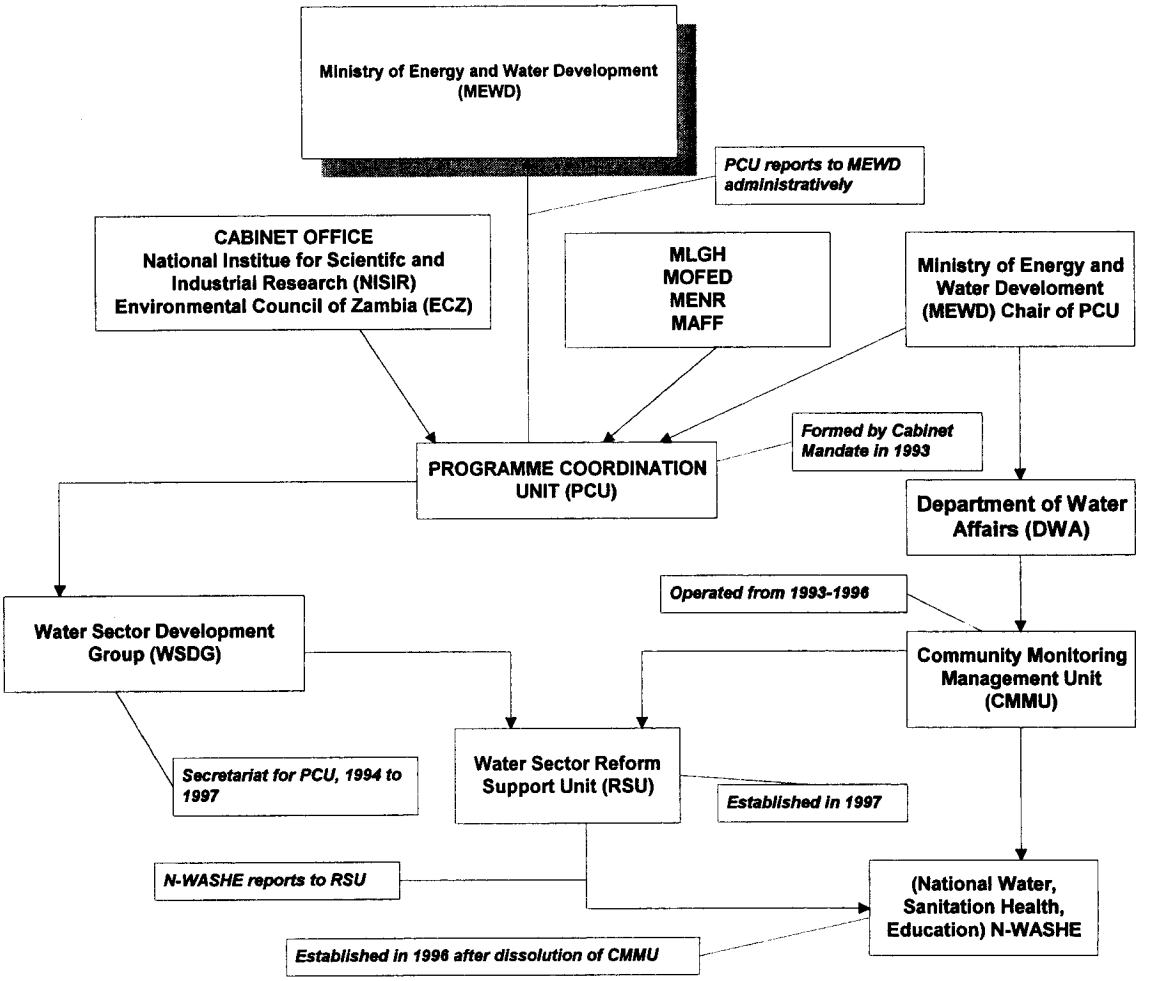
(b) *as a joint venture with an individual or with any private or public company*

(c) *as a joint venture with another local authority or several other local authorities*

Provided, that the majority shares shall be held by the local authority.

The WSS Act therefore, empowers local authorities to enter into service delivery arrangements in partnership with the private sector. It is envisaged from this piece of legislation that, the sector can derive benefits through association with the private sector, which can eventually result in service level improvements at a macro level.

Fig 1.1: Formation of the Water Sector Reform Unit (RSU)



MLGH	Ministry of Local Government and Housing
MOFED	Ministry of Finance and Economic Development (now Ministry of Finance and National Planning, MOFNP)
MENR	Ministry of Environment and National Resources
MAFF	Ministry of Agriculture Food and Fisheries (now Ministry of Agriculture and Cooperatives)

Another significant output of the reforms has been the establishment by local authorities of Commercial Utilities (CU's) in various locations of Zambia. By the end of 2002, ten CU's had been established and were fully operational. These are indicated in Table 1.3 and Fig 1.2 below;

Table 1.3: Utilities formed in Zambia to date

Name of Utility	Area of Service	Date Established
Lusaka Water and Sewerage Company	City of Lusaka	1988
Chipata Water and Sewerage Company	Chipata Town	1992
Nkana Water and Sewerage Company	Kitwe and Kalulushi	1999
Mulonga Water and Sewerage Company	Chingola, Mufulira, Chilabombwe	1999
Asset Holding Company-Mining Municipal Services (AHC-MMS)	All ex ZCCM areas	2000
Kafubu Water and Sewerage Company	Ndola, Luanshya, Masaiti	1999
Southern Water and Sewerage Company	7 towns Southern Province	1999
Western Water and Sewerage Company	6 towns Western Province	2000
North Western Water and Sewerage Company	7 towns North western province	1999
Chambeshi Water and Sewerage Company	11 towns in the Northern Province	2003

Source: NWASCO (2003)

- The AHC-MMS was formed as an interim measure, to provide water and sanitation services to areas that were previously serviced by the privatised mining conglomerate, Zambia Consolidated Copper Mines (ZCCM) Ltd.
- Central Province Local Authorities have not yet finalised the establishment procedures even though they have passed a resolution to establish a provincial water supply and sanitation utility.

- Luapula Province Local Authorities have not yet resolved to establish a provincial utility.

Despite having established these utility companies, there are still many factors that need attention and redress in the quest to bring about a marked improvement in levels of service. For example there exists amongst these utilities, very high levels of Unaccounted For Water (UFW) defined as "*the fraction of water produced but not billed for* (Kayaga and Franceys:1998)".

NWASCO (2003) states that, the average rate for Unaccounted for Water (UFW) for all the utility companies in Zambia for the period 2001 to 2002 was 51%, which falls well below the minimum internationally acceptable level of 25%. The high levels of UFW translate into very high production costs with low sales implying that the utilities are operating at a very low level of efficiency.

To address this particular problem, the utilities would have to improve upon the existing technical and commercial aspects of their current operational framework. The major requisite items needed to effect these improvements (i.e. capital for procurement of infrastructural components, highly skilled manpower etc.), are not readily available within their existing operational environment, which underscores the need for exploring alternative service delivery arrangements.

Fig 1.2: Distribution of service providers for Water Supply and Sanitation utilities in Zambia as at January 2004

SOURCE: URBAN WATER AND SANITATION SECTOR REPORT BY NWASCO, 2001/2002

1.2 RATIONALE

The Government of Zambia has through the WSS Act No. 28 of 1997 given responsibility of provision of water supply and sanitation services to local authorities. In this Act there are outlined several institutional arrangements which a local authority may pursue. Part 111 Section 9 subsection 1b provides for the entering into joint ventures with *"an individual or with any private or public company"*.

This option refers to the establishment of mutually beneficial partnerships between the public and private sector, which can act as a catalyst for the mobilization of desperately needed resources required to reinvigorate the sector. This approach however may not be the solution to Zambia's urban water supply and sanitation woes, as there is no guarantee that upon implementation of this service delivery arrangement there will occur;

1. Improvements in the overall quality of service
2. Better management practices
3. A realization of the much needed capital necessary for the rejuvenation of operations
4. Expansion of the network resulting in increased coverage over the service area

It is therefore imperative that for there to be a clear and unambiguous understanding of the full implications of the "Private Sector Participation (PSP)" service delivery arrangement in Zambia, an exhaustive study be undertaken to explore the various options that can be adopted, their applicability within the existing legislative, institutional and regulatory frameworks and to identify the inherent opportunities and constraints.

1.3 PROBLEM STATEMENT

Governments the world over, especially in developing countries, are experiencing an ever-increasing demand for improved health care, water supply, sanitation, education, housing, etc. Water has now moved to the top of the development agenda in most developing countries. Zambia now has one of the highest urbanization levels in Africa which according to GRZ (1999) is estimated at 50%. In the Capital City of Zambia,

Lusaka, the population residing in peri-urban areas is estimated at 60% of the total (Coates *et al.*, 2002). In peri-urban areas, the levels of service are often intermittent, scarce and in some cases even non-existent. The scarcity of good, reliable water supply and sanitation services poses a great challenge to service providers, policy formulators and other key stakeholders in the sector.

In the first decade after independence (1964 to 1973), Zambia followed a policy of import substitution, industrialisation and nationalisation of enterprises. This was supported by abundant mining revenues, which contributed to half of GDP and almost all the export earnings. However, since 1973, Zambia has experienced a steady and continuous economic decline mainly due to falling copper prices, rising oil prices and significant internal mismanagement of state owned enterprises, Local Authorities and other Government dependent organisations that benefited from state subsidies. This in turn led to massive external borrowing as an immediate stop gap measure to maintain the status quo and also as a means to avoid having to restructure the economy. As Zambia's capacity to repay debt became more and more unattainable, government's ability to effectively manage, finance, regulate and deliver social services was extensively eroded. In the water and sanitation sector, for example, there is currently an ever-increasing demand from consumers for an overall improvement in the level and quality of service due to several factors.

Currently consumers connected to the networks regularly experience;

(i) frequent water supply interruptions or even no supply at all due to low pressure in the network emanating from, leaking pipes and valves, insufficient back-up storage facilities, pump failure, vandalism and pilferage of fixtures

(ii) (ii)the quality of drinking water is not consistent due to problems encountered in the treatment process such as insufficient treatment chemicals, poor condition of the various elements at the treatment works infrastructure and poor condition of the transmission, storage and distribution infrastructure

(iii) persistent blockages (leading to back-flow) in the sewer disposal network due to poor or even lack of maintenance and rampant vandalism

On the other hand, the service providers also experience extreme operational difficulties, which inhibit their ability to provide a good quality service to their customer base. Some of the main problems are;

(i) low cost recovery rates, which affects their ability to replace defective equipment, procure treatment chemicals and pay reasonable wages to their staff

(ii) high production costs due to usage of well aged water and sanitation systems

(iii) inability to service debts arising from treatment chemicals, energy usage, telecommunications services, pension gratuities for retiring staff and statutory tax liabilities

(iv) inability by some service providers to attract highly qualified and experienced staff, due to their poor financial state

(v) low levels of willingness on the part of some of the recipients of the services provided to pay for services received, severely affecting their operational cash flows

(vi) for the newly formed CU's, an inheritance of a large work force from the engineering service department of the local authorities imposed by the shareholders (local authorities)

(vii) a high level of political interference by way of appointments of unnecessary staff and instructions to waive debts owed by some customers

According to RSU (1999), the investment requirements needed for Zambia to attain 86 to 100% coverage in urban areas by the year 2015 is United States dollars (US $) 683.2 million. It is not possible for government to single handedly raise this capital by the year stated from within the current macro-economic environment. The challenge is therefore for government to develop specific, achievable, realistic and sustainable strategies which can be used to completely overhaul the current state of affairs.

External support has been received from various international agencies and institutions. The support received from these organisations has accounted for the bulk of investment

in both the rural and urban segments of the water sector in Zambia. The main co-operating partners are outlined in Table 1.4 below;

Table 1.4: Cooperating partners in Zambia's water sector

Type of partner	Names of partners
Multilateral	World Bank (IDA), UN agencies (UNICEF, WHO, UNDP, UNHCR) European Union (EU) and African Development Bank (ADB)
Bilateral	DFID, The Netherlands (SNV), NORAD, JICA, Ireland Aid, Germany (KFW and GTZ)
Non Governmental Organisation (NGO)	Care International, World Vision International, PLAN International, Africare, Lutheran World Federation, Wateraid, Oxfam and other service organisations

Source: Assembled using data from various sources

In the last decade, Zambia has received substantial support from her external cooperating partners. The major receipts are outlined in Table 1.5 below;

Table 1.5: Zambia's receipt of support from some external partners

Name of donor agency	Amount provided (in US $ millions)	Project objective
ADB	20	Lusaka City water supply and sanitation system upgrading
ADB	23	Kitwe City infrastructure rehabilitation and upgrading project
World Bank (IDA)	37.7	Municipal township services project in ex ZCCM areas of the Copperbelt Province
World Bank (IDA)	30	The Urban (URWSP) project for nine towns in Southern Province

Source: Water Supply and Sanitation Sector Review – Final Report by BCHOD (2003)

It is obvious that this support is not a panacea for Zambia's funding gap. It is normally associated with the accomplishment of particular objectives, which in most cases does not obliterate the other problematic factors. Most developing countries are now turning to Foreign Direct Investment (FDI), as an alternative source of external finance in light of the declining levels of multilateral and bilateral funding. Aitken and Ann (1999) asserted that, most developing countries are now easing restrictions on FDI inflows through the offering of generous tax incentives, waiving of import duties for vital

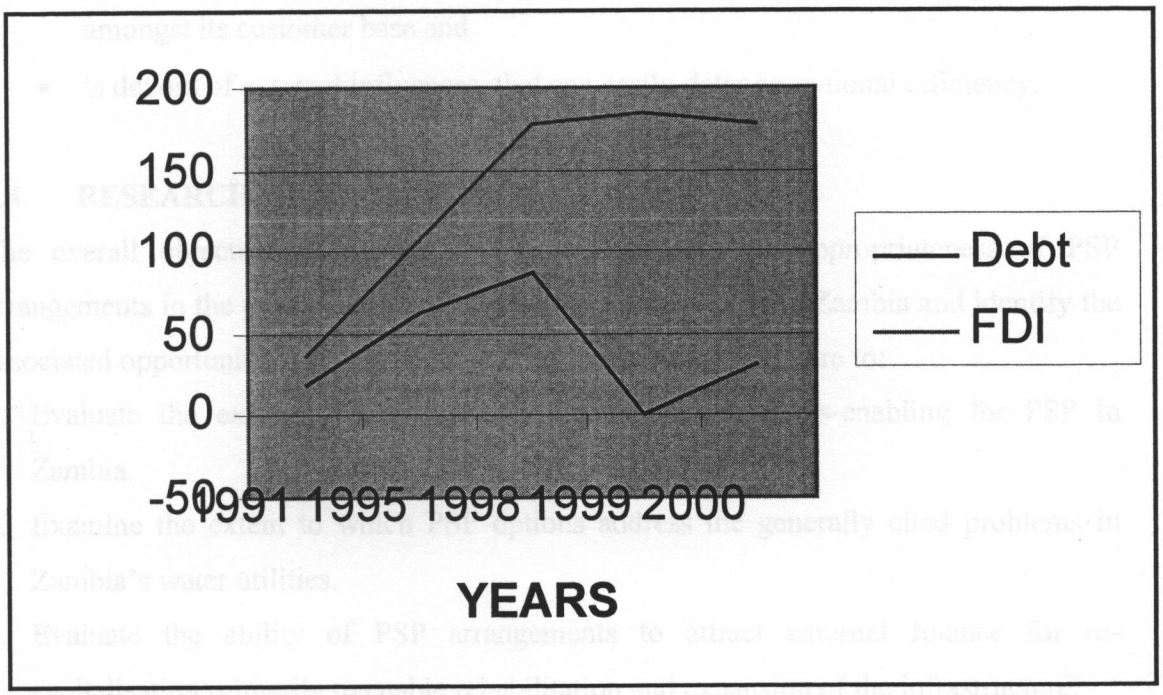
requisites and provision of other indirect subsidies in the hope that this will yield extensive benefits to their economies. Table 1.6 and Fig 1.3 below illustrate the debt inflows vs the FDI inflows into developing countries from 1991 to 2000.

Table 1.6: Debt inflow vs. FDI into Developing Countries (Billions of dollars)

	1991	1995	1998	1999	2000
Debt Inflows	18.8	63.0	87.9	-0.06	31.3
FDI	35.7	107.0	176.8	185.4	178.0

Source: World Bank (2001)

Fig 1.3: Graphical representation of Debt inflow vs. FDI into Developing Countries



Source: Own assembly using World Bank (2001) data

It is clear from the above that, FDI has been growing consistently whilst the availability of external debt has shown an inconsistent and declining trend over the years. GRZ (2000b) acknowledges that, *"at the broad macroeconomic level, Zambia's economic stagnation has led to low national savings that are inadequate to fund desirable investment. If the country were to depend entirely on its savings, investment would be*

low, resulting in a slow rate of capital formation, income generation and employment creation". The direct implication of this position is that, for Zambia to achieve meaningful investments in the sector, she will have to create an environment that is favorable for both local and foreign investment.

The challenge at hand therefore is, to develop an operating environment that will instill a strong sense of confidence amongst its customers and cooperating partners which;

- is sustainable
- can easily attract capital and investment from several sources as and when required
- can recoup its full operational and maintenance costs for services provided from amongst its customer base and
- is devoid of external influences, that can easily deter operational efficiency.

1.4 RESEARCH OBJECTIVES

The overall objective of this study is to investigate the appropriateness of PSP arrangements in the provision of water and sanitation services in Zambia and identify the associated opportunities and constraints. The specific objectives are to:

1. Evaluate the existing conditions that are enabling and dis-enabling for PSP in Zambia.
2. Examine the extent to which PSP options address the generally cited problems in Zambia's water utilities.
3. Evaluate the ability of PSP arrangements to attract external finance for re-capitalisation primarily to enable rehabilitation and expansion of the infrastructure.
4. Evaluate how each PSP option addresses the needs of the poor (vulnerable groups) and whether a pro-poor approach is feasible.

1.5 HYPOTHESIS

1. The inadequacy of the existing policy, legal, institutional and regulatory framework has constrained the expansion and efficient delivery of water and sanitation services to the needy

2. PSP in Zambia is stifled by Government interference
3. The private sector will not be attracted to enter the Zambian market because of poor infrastructure and low cost recovery rates
4. Delivery of water and sanitation services to the majority poor, through PSP, can enhance revenue mobilisation and sustainability of the network infrastructure

CHAPTER TWO

2. LITERATURE REVIEW

2.1 GENERAL

Improvement on the current levels of water supply and sanitation provision to communities has attained a prominent position amongst the issues that require immediate attention in most African countries. At the Millennium Summit held in September 2000 the (UN) Millennium Declaration was adopted. Goal No.7, Target 10 states that, *"the proportion of people without sustainable access to safe drinking water should be halved by the year 2015"*. RSU (1999) states that the implication of this statement for Zambia is that, by the year 2015, 4.02 million people should gain access to improved water sources at a total investment cost of US $ 225 million.

The existing low levels of performance and service coverage exhibited in the current service provision arrangements have led to adverse impacts on the general living standards of the communities most especially in urban areas. RSU (1999) states that, *"for a long time the Water and Sanitation sector in Zambia has not been performing to expectation. In almost every community, the sector has failed to meet the people's water and sanitation needs. This has largely been due to a history of neglect of the sector characterised by under-funding and poor staffing"*.

An examination of the Poverty Reduction Strategy Paper's (PRSP) for the countries of Ghana, Kenya, Tanzania, Zambia and Uganda (for example) illustrates the importance each nation is giving to the attainment of improvements upon the existing levels of water supply and sanitation services. Table 2.1 outlines the priorities for water supply and sanitation in the PRSP for each of these countries (Ghana, Kenya, Tanzania, Zambia and Uganda).

Table 2.1: PRSP Priorities for Water

GHANA	KENYA	TANZANIA	ZAMBIA	UGANDA
• Ensure effective management of urban and rural waste and sanitation systems • Increase access of urban population to safe water from 70% to 78%. • Mobilize financial resources for refurbishment and extension coverage of urban water systems • Reassess lifeline tariff to protect poor households living in compound houses. • Set up unit within ministry of works and housing to monitor provision of water to the poor	• Improve the institutional, legal and policy framework for the development and management of water supply	• Increase the provision of adequate safe and clean water to rural areas from 48.5% in 2000 to 55.5% by 2003.	• Increase access to safe drinking water in urban areas from 89% in 1998 to 100% in 2015 • Increase access to improved sanitation from 73% to 100% in urban areas by 2015 • Increase access to improved sanitation from 68% to 80% in rural areas by 2015	• Improve access to safe water in rural areas from 53% in 2001 to 60 % by 2004 • Improve access to safe water in urban areas from 62% in 2001 to 65% by 2004 • Increase new urban water connections from 6300 in2001 to 7000 in 2004

Source: PRSP reports Ghana, Kenya, Tanzania, Zambia and Uganda

It is evident that there is a common quest by all the countries in the table above, to bring about an improvement to the existing service levels and increase the overall accessibility to water supply and sanitation by communities. A direct implication of this objective is that, each country would have to re-evaluate its existing overall service provision strategies and ascertain what intervention measures would be required to be effected in order to address the new challenges.

GRZ (2000b) states that, in Zambia, the implementation of the PRSP strategies shall be guided by the following principles;

1. Sustainability or continuous functioning and utilization of facilities and services.
2. Pro-poor focus (proposed interventions will target the rural and urban poor in the specific geographical areas with high incidences of poverty as revealed by latest CSO surveys and census data)
3. Gender equity since the majority of the poor are female, and the improvement of their status has a much wider impact on the quality of life of the community as a whole.
4. Stakeholder participation is an important step in planning pro-poor interventions.
5. Continued emphasis on broad - based stakeholder collaboration so as to build linkages for addressing multi-facets of poverty, enhance economic growth, minimize mistrust and wastage of resources, and maximize learning and feedback.
6. Facilitating the participation of private actors (businesses and NGO's) to complement government efforts.

It can be inferred from the principles outlined that, the main key focus elements are;

- Sustainability
- A pro-poor focus which can lead to poverty reduction
- Involvement of the key stakeholders in the planning process
- Participation of the private sector

However, there is currently no coherent strategy outlined by any of the utility companies in Zambia to undertake interventions with the prime focus of addressing some of the targets stated in the MDG's.

Introduction of the private sector to participate in the service provision arena has emerged as a prominent theme in the quest to improve upon service delivery in some developing countries, Zambia included. This emanates from the widely held notion that the private sector possesses the attributes and qualities required to help bring about the needed transformations. Larbi (1998) agrees with this position by stating that, *"though the motive and expected advantages of contracting out may differ from one organizational or sectoral context to another, they generally include improvement in efficiency as a result of exposure to competition, cost savings and use of private expertise"*. This approach however, has not yet been fully tested in Zambia to determine its effectiveness, reliability and suitability to local conditions.

However there are contrary views held by some that, introduction of the Private Sector will not achieve the desired results most especially when issues such as "service provision to the poor" are taken into account. The concern stems from the fact that, since one of the prime objectives of the private sector is attainment of profit, it is envisaged that there will be no incentive for them to render services to a group who may not only ill-afford a "full cost recovering tariff", but might also be unwilling to do so even if concessionary tariffs are applied. Other issues that need detailed study and evaluation are the policy, legislative, institutional, socio economic and regulatory frameworks in existence.

2.2 THEORETICAL AND CONCEPTUAL REVIEW

2.2.1 Private Sector Participation (PSP)

There is a growing trend amongst governments worldwide to turn to the private sector to help foster the development and delivery of water and sanitation services. This is largely due to the skills and attributes the private sector possesses such as, efficiency in operation, adherence to commercial principles, good service delivery and easier access to financing for new investments. Plummer and Nhemechana (2001), define Private Sector Participation (PSP) as, *"the involvement of the private sector in some form, at some stage in the delivery of services. It is a general term that is used to cover a wide range of private sector involvement from the service contract, management contract, concession*

and Build Operate and Transfer (BOT). It may also include informal sector participation". Plummer and Nhemechana (2001) define privatisation as the, *"transfer of ownership to the private sector"*. It is clear that there is a distinction in meaning between PSP and privatisation. The former refers to a partnership service arrangement involving the private and public sectors (or sometimes referred to as a "Public–Private Partnership", PPP) whilst the latter refers to a complete transfer of ownership and responsibilities to the private sector.

Since independence in 1964, Zambia's water supply and sanitation sector has had several private sector participation contract arrangements. Prior to the inception of the reforms in the sector, the main service providers who were engineering service departments within the local authority establishments, did invite the private sector on several occasions to undertake contracts under the "service contract type arrangement" whereby, the private sector performs *"a specific service for a specific period at an agreed fee"* on certain segments in the service delivery process such as;

- Meter Installation
- Pipe and valve installation and replacement
- Computerization of billing services
- Borehole drilling and equipping
- Reservoir construction
- Rehabilitation of treatment works

The rationale behind this approach is that, the private sector possesses the specialized skills needed to facilitate the speedy delivery of good quality products and services.

There is a growing trend amongst governments in Africa to involve the private sector at a much higher level than the "service contract" type arrangement. This is largely due to the current status quo where, service levels have in some cases reached their lowest ebb due to several reasons already outlined in the previous chapter. This assertion agrees with that postulated by Eggers and Langert (1998) who stated that, *"there has been a recent surge of interest by the private sector in owning or at least operating municipal systems"* and that, *"the private sector's participation in the operation of municipal water and*

waste water systems is becoming more as a prevalent way of providing increased services at a reduced cost".

The basic "route" or "path" undertaken by most governments to procure PSP is somewhat similar. The first stage in the process is usually the review of the existing policies and the eventual development of a new National Water Policy (NWP). The subsequent stages relate to the enactment of new legislation and the rearrangement and or creation of new institutions. Fig 2.1 outlines the stages that a country normally undergoes from a wholly publicly owned and managed service delivery arrangement to one managed and operated by the private sector.

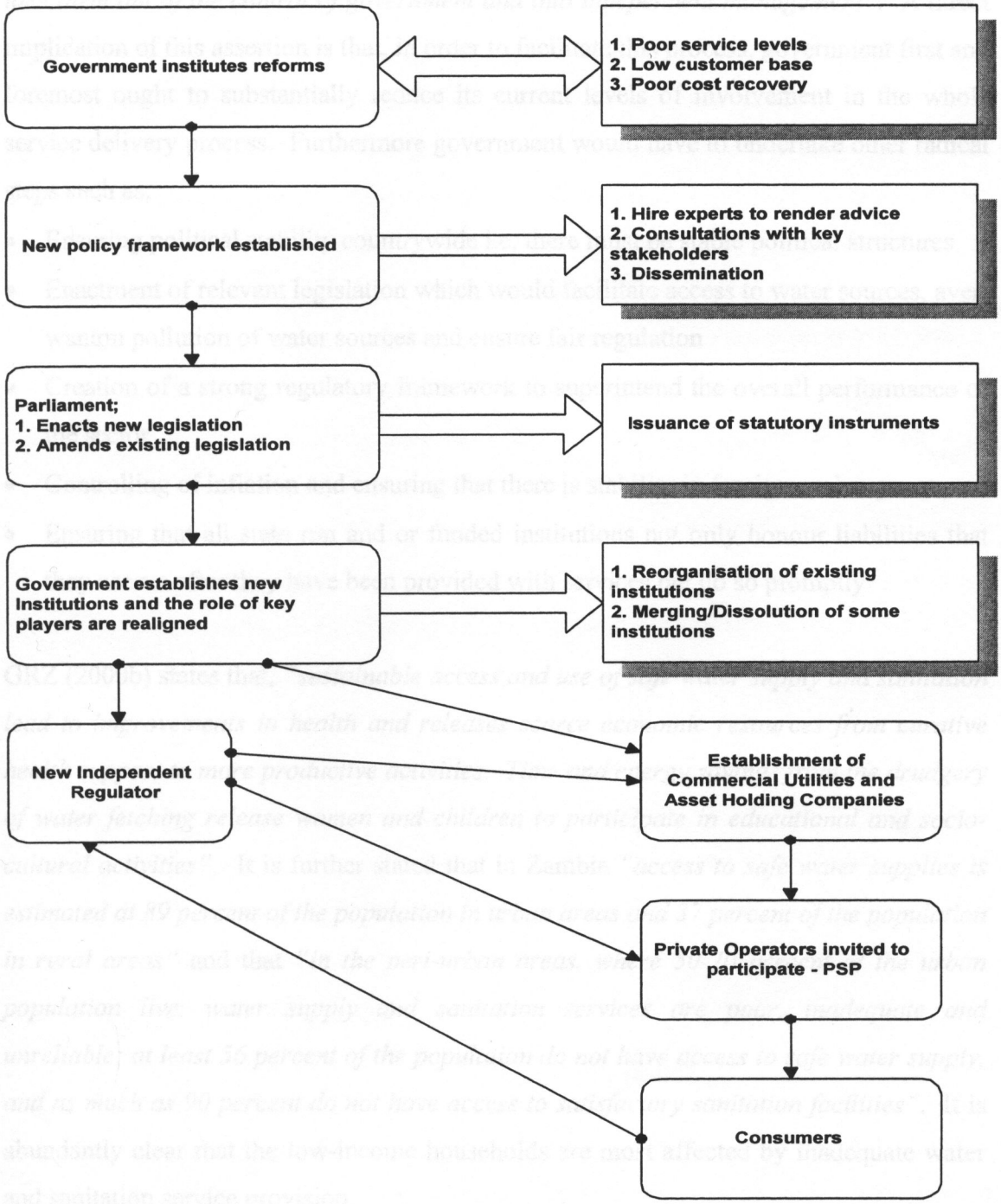
According to the World Bank (1997a), a government's prime objectives in inviting the private sector to participate in water supply and sanitation are primarily to;

- Bring technical and managerial expertise and new technology into the sector
- Improve economic efficiency in the sector-in both operating performance and the use of capital investment
- Inject large-scale investment capital into the sector or gain access to private capital markets
- Reduce public subsidies to the sector or redirect them from sections of the populace s currently served to the poor and those without access to services
- Insulate the sector from short-term political intervention in utility operations and limit opportunities for intervention by powerful interest groups
- Make the sector more responsive to the consumers' needs and preferences

The involvement of the private sector will sound very palatable to government policy makers, in that there is the perceived inevitability of government "hiving-off" the current burden of providing subsidies to the sector, which currently exerts a lot of budgetary pressure on the national treasury. According to the World Bank (1996) it is stated that, *"where privatisation is accomplished through the closure of existing enterprises, the resources generated may be used to pay down public debt" and that, "when an infrastructure enterprise is operating efficiently, it may also be the source of ongoing*

taxation revenues, in contrast to the large budget drains typically represented by public enterprises in many countries".

Fig 2.1: Stage by stage Transformation process from wholly Public to PSP service arrangement



However, there are new roles and associated responsibilities that arise with the entry of the private sector in service provision. Governments will have to create an enabling environment for the private sector to operate uninhibited. Pirie (1992) states that, *"another aim of privatisation is to make industries commercial instead of political: to take them out of the control of government and into independent management"*. A direct implication of this assertion is that, in order to facilitate this process, government first and foremost ought to substantially reduce its current levels of involvement in the whole service delivery process. Furthermore government would have to undertake other radical steps such as;

- Ensuring political stability countrywide i.e. there must be stable political structures
- Enactment of relevant legislation which would facilitate access to water sources, avert wanton pollution of water sources and ensure fair regulation
- Creation of a strong regulatory framework to superintend the overall performance of the sector
- Controlling of inflation and ensuring that there is stability in foreign exchange rates
- Ensuring that all state run and or funded institutions not only honour liabilities that they accrue after they have been provided with services but do so promptly

GRZ (2000b) states that, *"sustainable access and use of safe water supply and sanitation lead to improvements in health and releases scarce economic resources from curative health support to more productive activities. Time and energy savings from the drudgery of water fetching release women and children to participate in educational and socio-cultural activities"*. It is further stated that in Zambia *"access to safe water supplies is estimated at 89 percent of the population in urban areas and 37 percent of the population in rural areas"* and that *"in the peri-urban areas, where 50-70 percent of the urban population live, water supply and sanitation services are poor, inadequate and unreliable; at least 56 percent of the population do not have access to safe water supply, and as much as 90 percent do not have access to satisfactory sanitation facilities"*. It is abundantly clear that the low-income households are most affected by inadequate water and sanitation service provision.

There is however the strongly held notion that, "government's continued involvement in the service delivery arena has been bolstered by its desire to ensure that, the service is accessible to the poor and vulnerable who constitute the majority of the communal population". This position is in agreement with Phiri (2000) who states that, *"while the commercialisation that Zambia's water and sanitation act seeks to support may bring many benefits in terms of incentives for service delivery, it is not necessarily a comprehensive solution and risks marginalizing the poor"*. WUP (2001a) underscores the assertion by Phiri (2000) by stating that, *"in many African cities, the long term future of water utilities and the sustainability of reform will depend on success in extending services to low income communities"*. PSIRU (2002) also gives strong credence to the positions asserted by Phiri (2000) and WUP (2001) by stating the following;

1. The poor are not an easy market for the private sector, as the very task of getting the private sector to focus on the alleviation of poverty and to design tariffs in a way that does not discriminate against the poor has proved hard to achieve in practice (due to perceived poor cost recovery amongst the poor).
2. In instances where the risk levels are perceived to be too high, the private sector may fail to deliver the services and interventions would have to be made by various financing institutions to improve capacity and upgrade the public sector utility service arrangements.

It is clear therefore that, any new interventions that may be adopted ought to pay special attention to the unique and specific needs of the urban poor. A "pro-poor" approach is inevitably a strong and viable proposition if at all the involvement of the private sector is to be well received by governments in the third world. The question that arises therefore is whether the private sector can adequately cater for the needs of the poor and if so, what would the likely impact of this approach have on their business operations.

2.2.2 Public-Public Partnership

In this arrangement the publicly owned and managed institutions enter into a partnership with the sole objective of providing services. It is envisaged that in this arrangement

there will be a mutually beneficial association between the two (or more) publicly owned institutions that are participating. The partnership is normally regulated through a contract. There are several formats namely;

- A joint venture between various municipalities to provide WSS services to communities within their mandate areas. This has been provided for in Zambia under the Water Supply and Sanitation Act No 28 of 1997 part III Section 9.1 sub –sections b and c.
- An "in-house" contract arrangement between the headquarters of a utility company and the various branches (divisions) that it has set up. This arrangement is in use in Uganda, between the service provider, the National Water and Sewerage Corporation headquarters and its branches in the smaller districts around the country.
- A performance contract between the government and the service provider.

The performance indicators are arrived at by both parties after an exhaustive mutual consultative process. This is so in order to ensure that the set targets are realistic, achievable and that there is a general sense of ownership by those responsible for operations and overall management of the process. Other key characteristics of these contracts are;

- Improvement of cost effectiveness
- Efficient services delivery
- Granting of incentives and disincentives as the main drivers of performance

2.2.3 Types of PSP

There are several different types of PSP arrangements that can be adopted. At the lower entry level i.e. (service contracts), the state retains full responsibility for operations, maintenance, capital investment, financing and commercial risk whilst at the higher end (full divestiture) the state's involvement is minimal (mainly plays a regulatory role only) since the private sector takes on full responsibility for operations, maintenance and investment. The table below gives the most common types of PSP available and the allocation of key responsibilities and average durations of each option when adopted.

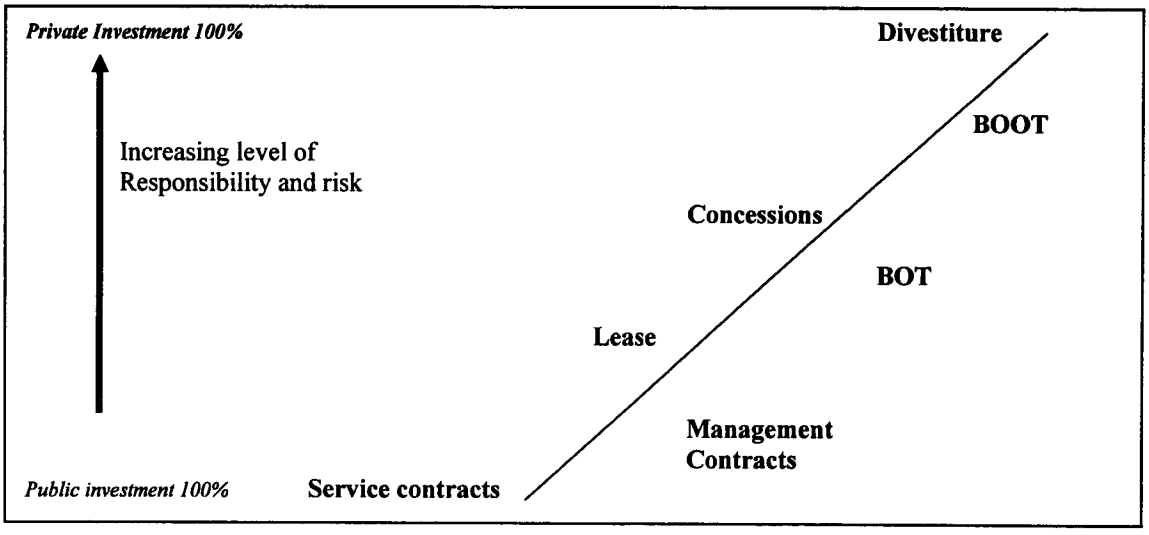
Table 2.2: Allocation of key responsibilities under the main PSP options

Option	Asset ownership	Operation and maintenance	Capital investment	Commercial risk	Duration
Service contract	Public	Public and private	Public	Public	1-2 years
Management contract	Public	Private	Public	Public	3-5 years
Lease	Public	Private	Public	Shared	8-15 years
Concession	Public	Private	Private	Private	25-30 years
BOT/BOO	Private and public	Private	Private	Private	20-30 years
Divestiture	Private or private and public	Private	Private	Private	Indefinite (may be limited by license)

Source: World Bank (1997b) – Tool kit, "Selecting an option for PSP"

This table is illustrated further in Fig 2.2 which shows the level of responsibility amongst the various contract type arrangements;

Fig 2.2: Level of Responsibility amongst various PSP options



Source: World Bank (1997b), Tool kit-Selecting an option for PSP

2.2.3.1 Service Contract

This is the simplest form of PSP whereby the State Owned Enterprises (SOE), retains overall responsibility for operations, maintenance and capital investments required for the network except during the execution of single function contracts, which focus on "specific services" only. The private sector participates through execution of the specific assignment over an agreed duration usually not longer than 2 years. The contract types can range from replacement and installation of meters, valves defective segments of the pipe network or even improving the billing system.

The SOE bears the entire commercial risk as well as overall responsibility for financing the works. The main benefit to the SOE is that they take advantage of the experience and expertise inherent in the private contractor and learn different aspects pertaining to the works from them, which sometimes results in improvement in the operating techniques and efficiency. These contracts are awarded usually after a rigorous competitive bidding process, which ensures that the best bidder executes the contract.

2.2.3.2 Management Contract

In the "Management Contract" type of option, the publicly owned authority transfers the responsibility of operation and maintenance of the system to the private sector. The overall responsibility for capital investment and working capital remains with the public authority (Government) implying that all the commercial risk is still vested in the government. Payments to the private operator may take any of the following forms;-

- Payment of a fixed fee for performing pre-agreed managerial tasks devoid of overall control on functions that affect productivity and or quality.
- Payment based on the achievement of set out, clearly defined performance targets. Examples of these can be improved collection rates and reduction in Unaccounted for Water (UFW).

The impediment to this approach however is that, some of the set out targets e.g. reduction of UFW (which can be achieved largely through repair of leaks and installation of meters), are dependent on the public authority availing all the financial requirements.

The problem arises when the public authority fails to do so and the likelihood of this occurring is extremely high. In the first place the public authority invites the private sector to participate in the service delivery process so as to increase the overall operating efficiency thereby creating conditions favourable for new investments and accessing of new capital from the private sector.

However the management contract option is regarded as a cardinal first step for increased levels of PSP in future. This is so because this arrangement poses to be and ideal situation where information on various aspects of the utility pertaining to the socio-economic, political, environmental and engineering related issues can be accurately gathered. The information should specifically focus on the following issues;

- Accounting records
- Consumer records i.e. payment trends, supply demand levels, population, income levels and affordability of set tariffs
- Condition of the network infrastructure
- Human resource levels and the corresponding training needs
- The overall political environment

According to the World Bank (1997b) it is stated that, a management contract might be chosen where the following factors are at play;

- *Tariffs are too low to support a commercial operation, and the government needs time to increase tariffs or develop a system of public subsidies compatible with PSP*
- *The regulatory framework has defects that need to be remedied before a long term private sector can be secured*
- *The country lacks a good track record in public-private partnerships*
- *The government faces difficulties in getting key stakeholders to agree to long-term involvement of the private sector*

2.2.3.3 Lease Contract

In this arrangement a private operator leases or rents out the assets of the utility from a public authority. The private operator assumes full responsibility of management, operation and maintenance of the entire system whilst the public authority retains

responsibility for planning and financing for new investments and major refurbishment of the physical infrastructure. Leases are most suitable in scenarios where the infrastructure is in a relatively sound condition and needs very little capital investment the major need being a big improvement in the overall operating efficiency.

The payment formula to the private operator is usually performance based and could be derived from the difference between the tariff revenues collected and the operating costs. This provides an incentive to the private operator to provide a high quality level of service coupled with good billing and collection practices.

2.2.3.4 Concession

In a Concession contract arrangement, the private operator assumes responsibility for operation, management, maintenance and capital investment for the whole utility. This contract type has an average duration of 25 years and the assets are transferred back to the public authority after the expiry of the contract duration. This arrangement is most suitable where the state needs not only enhanced operational efficiency, but also capital investment.

2.2.3.5 Build Operate Own Transfer (BOOT)

In the "BOOT" type contract the private operator assumes responsibility for financing, building, operation and management of the facility. The assets are transferred to the public authority after an agreed duration, (normally after capital costs and reasonable return on investment are realized).

2.2.3.6 Build Operate Transfer (BOT)/ Rehabilitate Operate Transfer (ROT)

In this arrangement type, the public authority invites the private sector to participate in the operations of a particular segment of the network, which is problematic and needs special attention in order to enhance operating efficiency. Examples are if the utility has problems with bulk water supply, storage of treated water or treatment of waste-water. The private operator may undertake the construction and or rehabilitation of a specific

component of the network, operate it for a specific period and relinquish all rights to the state at the end of the contract period.

2.2.3.7 Build Operate Own (BOO)

The market is de-monopolized in whole or in part. The private sector (after identifying gaps in the existing service arrangement), enter the market foray at their own risk. This can be side by side with the existing service provision arrangements rendered by the state. There are however unique challenges with this approach. The incumbent service provider (state owned) continues to provide services but will now have to substantially improve on operating efficiency and quality of service to avert rapid loss of customers to the new entrant. The other main challenge is that of creation of a "level playing field" between the state owned and privately owned utilities in order to eradicate distortions. In this arrangement the asset ownership remains indefinitely with the private operator.

2.2.3.8 Divestiture

In this arrangement the private operator assumes responsibility for operations, management, maintenance and capital investment. The ownership of the assets is transferred to the private operator by the state through;

- The sale of assets
- A management buyout
- Sale of shares

The WSS Act No. 28 of 1997 states that the majority shareholding of any water supply utility shall be held by a local authority that established it. This implies that it is unlikely that a divestiture would be feasible in Zambia.

2.2.4 Benefits Associated with PSP

There are many benefits that can be derived by local communities and the Nation as a whole through invitation of the private sector to participate in service delivery through PSP arrangements. The rationale behind this school of thought stems from the widely held notion that, the private sector will enhance operational efficiency and overall quality of service. Kelly (1998) agrees with this position by stating that, *"municipalities often*

are not equipped to efficiently operate complex plants, because they lack economies of scale in management and chemical procurement and may be subject to highly restrictive labour agreements".

Pirie (1992), enumerates the ten principle objectives of privatisation as follows;

- *Lowering of costs*
- *De-politicizing decisions*
- *Better service quality*
- *Better management*
- *Improved labour relations*
- *Wider share ownership*
- *Restoration of profitability*
- *Recapitalisation*
- *Competition and choice*
- *More competitive price structure*

and that all the above objectives are achievable, so long as there is a deliberate effort from all the stakeholders to make privatisation work. It should be noted that, the above objectives are those of a PSP service delivery arrangement since all the different variants of PSP are based on the principles of privatization.

For the local populace, the major benefits are;

- Reduction in incidence and occurrence of water borne diseases
- Overall improvement of the general living environment
- Increased access to these services thereby reducing time spent on queues in order to obtain daily water needs.

For government the major benefits are;

- Reduction or even complete removal of subsidies to the sector leading to extra funds being available for other needy sectors
- Increased collection efficiency by the utility, which yields higher tax revenues by way of Value Added Tax (VAT) on consumer bills and corporate tax from the utility company.

- Reduction on expenditure to be spent on health requirements for communities due to reduction in occurrence of water borne diseases

There are several disadvantages of private sector participation perceived or otherwise.

- There is a strongly held notion that access to safe water is and sanitation is a basic human right, therefore the question of how the private sector would recover costs from those who cannot afford the services arises.
- The extension of services to the poor is not a priority for the private sector due to difficulties in collection of revenue, inability and unwillingness to pay amongst a large proportion of the customer base.
- Entry of the private sector into the service delivery arena brings with it capital investment required to enhance operational efficiency. This capital usually sourced from private lending institutions and bilateral financial institutions, has several conditionalities attached to it such as increasing of tariffs and strict enforcement against defaulters, which may act as a catalyst for social unrest.
- Procurement of a private operator without exhaustive baseline information can lead to poor execution of the PSP contract implying that there will be poor service delivery to the consumers.

2.2.5 Performance Indicators (Benchmarking)

Significant progress in the water supply and sanitation sector can be realized with improved performance of the various service providers. Striving to achieve "best practices", "innovative ideas" and "highly effective operating procedures" will lead to high level performance of a service provider. Benchmarking is defined as, *"a quantitative comparative assessment that enables utilities to track internal performance over time and to compare this performance with that of similar utilities"*, Blankenship *et al.*(1998). The rationale here is that, a utility can identify areas in which it performs relatively well compared with other utilities, as well as the areas in which its performance needs to be improved. This process can help a utility to establish realistic levels of performance. The steps followed in the benchmarking process are outlined in Table 2.3;

Table 2.3: Methodology for process benchmarking

STEP ONE	Identify key focus areas for comparison
STEP TWO	Gathering internal data for those key focus areas
STEP THREE	Identifying potential benchmarking partners
STEP FOUR	Preparing for and undertaking benchmarking visits
STEP FIVE	Implementing best practices

Source: "Report of Performance Indicators for African Water Supply and Sanitation Utilities 2001" by the Water Utility Partnership

It is imperative therefore that criterion be established that can be used to measure the performance of the service provider. The criteria can be used in any of the following arrangements;

- Public – Public Partnership
- Public – Private Partnership

According to the WUP (2001b), the indicators are normally arrived at using the "S.M.A.R.T." criteria. This management tool emphasizes that the indicators should be;

SPECIFIC	The target should be clear and devoid of complex conditionalities
MEASURABLE	The target should be measurable both qualitatively and quantitatively
ACHIEVABLE	The target should be attainable in a normal operating environment
REALISTIC	The target should be manageable and within the control of the operator
TIMELY	The target should be completed within an agreed time scale

These targets are compared against the "Baseline data" which is obtained prior to the engagement of a private operator. It is imperative therefore that the data should be accurate so as to ensure that true as opposed to fictitious operational efficiency gains are realized.

It has been realized that the capacity of under-performing institutions, can be enhanced through collaboration between utilities operating in similar operating environments. It is envisaged that, with this information utilities can easily compare their performance

relative to others and easily determine what the performance gaps are in order to facilitate performance improvement. In Africa, a study was conducted by the Water Utility Partnership (WUP) in October 2001, which focused on collection of data on various performance indicators from over twenty utilities.

There are several key performance standards in use namely;

(i) Unaccounted For Water (UFW)

This is a measure of the leakages and other system losses. It includes network losses due to defective fixtures and installations, theft from the network through unauthorized connections and unmetered for water through provisions such as fire hydrants. Each utility can adopt its own optimal value taking into account factors such as water resources availability and level of water conservation.

UFW = (A –B)/A %

Where; A is the average yearly volume of water delivered by the operator

B is the average yearly volume of water billed by the operator

According to NWASCO (2003), it is stated that internationally the following are the acceptable norms for UFW as outlined in Table 2.4 below;

Table 2.4: Showing UFW benchmarks

Good	Less than 20%
Acceptable	20 to 25%
Unacceptable	Greater than 25%

Source: NWASCO (2003)

(ii) Metering Ratio or Efficiency

This indicator refers to the ratio between the un-metered and metered connections.

Metering Efficiency (ME) = N/L %

Where; N is the number of metered connections

L is the Total number of connections

(iii) Collection Efficiency

This indicator measures the revenue collection efficiency of the utility. It shows how much revenue has been collected compared to how much has been actually collected over a specific period.

Collection Efficiency (CE) = TC/TB %

Where; *TC is the total monthly (or annual) collection*

TB is the total monthly (or annual) billing

This indicator may have to be adjusted in cases where government has a poor record of paying for services provided. The government collections are normally measured separately to avert distortions. Table 2.5 below shows the benchmarks for collection efficiency.

Table 2.5: Showing Benchmarks for collection efficiency

Good	Greater than 95%
Acceptable	90 to 95%
Unacceptable	Less than 90%

Source: NWASCO (2003)

(iii) Staff Efficiency

This indicator refers to the "the number of staff per 1000 connections". It is expressed as the ratio between the number of staff and number of connections multiplied by 1000.

Number of staff per 1000 connections = NS x 1000/NC

Where; *NC is the total No. of connections*

NS is the total No. of staff

The benchmarks for staff per 1000 connections are given on Tables 2.6 and 2.7 below;

Table 2.6: Showing Benchmarks for Staff per 1000 connections - large companies

Good	Less than 5
Acceptable	5 to 8
Unacceptable	Greater than 10

Source: NWASCO (2003)

Table 2.7: Showing Benchmarks for Staff per 1000 connections – small companies

Good	Less than 8
Acceptable	8 to12
Unacceptable	Greater than 12

Source: NWASCO (2003)

(iv) Connection Efficiency

The connection efficiency basically indicates the level of inactive connections in the network. The connection efficiency is the ratio between the number of active connections to the total number of connections.

Connection Efficiency (C) = J/L

Where; J is the Number of active water supply connections

L is the total number of Connections

(v) Constancy of supply

This is used to measure the average percentage of time in which 100% of the customers have piped water supply during the peak season. In Zambia it is usually in the dry season running for an average of seven months (April to October).

$$\text{Average \% of continuous flow} = \frac{\text{No. of recorded hours of flow April to Oct.}}{\text{7 months X 720 hours per month}} \times 100$$

(vi) Percentage population served

This indicator represents a measure of the service coverage of the utility. The greater the service coverage, then the greater the utility's service to the local community. It can indicate to what extent coverage has reached the peri-urban areas which is extremely problematic in SSA. It however does not measure the quality of the service provided to the recipient communities.

Percentage population served = $\frac{\textit{Total No. of persons served x 100}}{\textit{Total No. of persons in area of operations}}$

Utilities should aim to achieve at least 90% coverage.

(vii) Percentage increase in domestic connections per year

This indicator represents a measure of the rate of expansion of the system. This indicator is most useful in locations where there is poor service coverage with much scope for growth. It will be very low in areas where there is very high coverage.

Percentage increase connections = $\frac{\textit{No. of new dom. connections during last year x 100}}{\textit{No. of dom. connections at start of year}}$

(viii) Percentage increase in new standpipes (s.p.) per year

This indicator represents a measure of the rate of expansion of the system. The greater the value of this indicator, the greater the expansion of the system over the year. In locations where there is a quest to increase the number of standpipe connections, this indicator will indicate the extent to which this problem is being addressed.

Percentage increase in s.p. conn. = $\frac{\textit{No. of new s.p. connections during last year x 100}}{\textit{No. of s.p. conn. at the start of the year}}$

2.2.6 Pre-requisite conditions for PSP

There are several pre-conditions that the private sector normally wants addressed prior to any meaningful participation in the WSS sector. These are so in order to ensure that their investments are protected and that they would be able to gain a reasonable rate of return and also that the risks associated with the proposed business venture are minimized as far and as much as practically possible.

According to WEDC (2002a), it is stated that the main pre-conditions that a prospective private operator would require are the following;

1. A strong political will to allow private access to the water sector
2. Stable political structures

3. Controlled inflation and stable foreign exchange rates (or a fair means of compensating for uncertainty)
4. A strong legislative structure providing for fair regulation
5. Transparency in the selection process
6. Credit-worthy customers backed by sovereign government guarantees
7. A strong and well established regulatory regime protecting not only the rights to abstract water but also the prevention of pollution of the raw water.
8. Freedom from political interference in the operation of the sector and absence of socio-political interference in the setting of tariffs and the acceptance that the water "business" has to be operated in a financially sustainable way that is affordable by the people.

It is clear that development of new policies, enactment of appropriate legislation and the establishment of new institutions is in itself not sufficient for effective and successful PSP. The overall role of government is integral for success to be achieved i.e. ensuring that there is a drive towards attainment of good macro-economic performance and adherence to high standards of corporate governance.

2.2.7 Public versus Private Sector providers

There has been intense debate on the adoption of the private sector in preference to publicly owned (and managed) institutions in the provision of WSS services worldwide. A number of problem areas have been identified with the usage of the PSP approach. Hall (2002) enumerated the several problems inherent with private concessions. They are;

- **Lack of competition:**

There is insufficient competition amongst the companies that normally bid for these contracts. Since there are very few multinationals involved in this industry, there will not be much competition amongst them, which is cardinal to yielding the most appropriate bid, necessary for provision of the best service arrangement to the consumers.

- **High Prices:**

The private operators will most likely charge higher tariffs compared to publicly managed service provision arrangements. In Table 2.8 below a comparison of the tariffs under the two service arrangements is outlined;

Table 2.8: Water prices under municipal provision, delegated management and public – private joint ventures in France, 1994 to 1999

(Average prices for yearly consumption of 120 cubic meters in French Francs)

Management	1994	1995	1996	1997	1998	1999
Municipal	1489	1621	1716	1803	1848	1841
Delegated/Private	1784	1908	1993	2050	2100	2100
Public-Private Joint Venture	1734	1812	1963	2014	2076	2101
Average all modes	1689	1799	1910	1974	2015	2049

Source: DGCCRF (Direction generale de la consommation, de la concurrence et de la repression des fraudes); published in "la Reforme de la politique de l'eau" Conseil Economique et Social; Journal officiel de la Republique Francais 2000 No. 14; November 2000

It is clear from the table above that, the tariffs are lowest in the municipal (publicly owned and managed) service arrangement in comparison to the other forms of service provision.

- **Problems with private management**

The private managements are found at times not to adhere to the set out performance targets which can lead to poor levels of service and even termination of the contracts entered into.

2.2.8 Multinational Service providers

Water and Sanitation services World-wide are provided either by the public or the private sector. The private segment of this industry is currently dominated by a few multinational corporations, which mainly emanate from Europe. Table 2.9 below shows some of the various multinationals and other relevant details.

Table 2.9: Multinational Water Supply and Sanitation providers

Company	Country of Origin	Company presence (selected cases)	Major Subsidiaries
Bouygues Group	France	Canada, China, Zambia	Saur Group
Biwater plc	United Kingdom	Tanzania, South Africa,	GNUC, City Water Services, Cascal
RWE AG/Thames Water	United Kingdom and Germany	USA, UK, Canada, Indonesia	American Water- Works
Suez	France	USA, Philippines, France, Uganda, Uganda	Ondeo, United Water Resources
Vivendi	France	France	Vivendi Environment

Source: Assembled using data from "The Water Barons" by The Center for Public Integrity and "Water for all" by The Public Citizen's Critical Mass Energy and Environmental Program

Grusky (2003), states that, *"only 5% of the World's water services are currently run by private companies"* largely because *"the private companies were not interested in owning or managing the water utilities"*. She further claims that the multinationals have developed an interest in this sector because of *"the growing freshwater scarcity and the prediction that water will be the oil of the 21st century"*.

2.2.9 Small Scale Independent Providers (SSIP)

When there is poor or inadequate level of service to consumers by the service provider, there arises the availability of opportunities for another category of provider. These are known as the Small Scale Independent Providers (SSIP). These are mobile vendors who provide WSS services using trucks or smaller receptacles to haul water for distribution at central locations or directly to individual dwellings. In Sub–Saharan Africa and in most developing nations this category of provider serves a large portion of the population.

According to the World Bank (1997a), private vendors serve up to 90% of households in some African towns and this represents in some cases 30% of the total household income. Table 2.10 illustrates the findings for a select sample of towns in Africa.

Table 2.10: Private Water Vendors in Africa

PLACE	HOUSEHOLDS SERVED BY VENDORS (%)	PRICE PER LITRE VENDED WATER (US $)	SHARE OF HOUSEHOL INCOME (%)
Mandera, Kenya	90	0.040	>30
Biourbel, Senegal	90	0.008	3
Gankida, Nigeria	15	0.020	-
Ibi, Nigeria	40	0.040	>30
Boundiali, Ivory Coast	50	0.005	3
Guidan Rouondji, Niger	40	0.007	26

Source: Lewis and Miller 1987 in "Privatization of Infra-structure in Africa" World Bank Technical Paper No. 337 (1997)

2.2.10 Risks associated with PSP

There is a significant level of risk that is synonymous with the private sector assuming responsibility for service provision. These risks are in a variety of forms and they need to be specifically addressed and the implications of the effect each one would bear on the proposed contract enumerated and analysed. Rees (1998) claims that, the more risk there is perceived to be, the higher will be the return on capital required by the private sector for any investments they would make implying that, some countries will simply be unable to find a willing investor because the market and or political conditions are not favourable.

There are two main types of risks that are associated with the adoption of a PSP service delivery arrangement. These are Macro and Micro level risks.

(a) Macro level risks

These are risks that exist at the country (and sector) level such as;

(i) Political

The political risks are mainly two-fold i.e. National instability and political sensitivity (or acceptability)

- **National instability**

It is unlikely that privately owned institutions would venture into a country that exhibits extreme political instability evidenced by civil unrest,

unlawful removal of governments and lack of respect for the constitution. The uncertainty levels in this scenario are very high such that the would be private operator would be unwilling to undertake any large investments and instead would strive to make very quick returns on the little investment. This will lead to high tariffs and very low levels of service.

- **Political sensitivity**

Macleod and Karadsheh (1997) state that, the entry of the private sector into the foray, which has previously been the exclusive domain of the public sector will give rise to changes in the

1. Tariff levels
2. Tariff structure and
3. Ownership and control

The main concern here is that the tariffs may be adjusted upwards to politically "unacceptable levels" in order to achieve full cost recovery by the private operator. The question of ownership and control also features prominently most especially when a foreign operator is involved as it is generally considered unacceptable for ownership of such strategic assets to be under the jurisdiction of foreigners.

- **Economic stability**

Fully-fledged government support for the whole process is inevitable for success. The government ought therefore to demonstrate consistently, un-waivered support to the process giving assurance that it will honour its obligations and other cardinal responsibilities

(ii) Market risk

The type and cost of investments which are required to improve levels of service should be measured against the ability and willingness (i.e. affordability) of the beneficiary consumers to pay for these services. This is so in order to enable the operator recoup the investment and covers the overall operating costs. It is therefore incumbent upon government to enact legislation that enables the operators to;

- Cut off supply in the event of non-payment

- Prohibit illegal connections

These measures can substantially mitigate the negative of impact that this risk may render.

(iii) Regulatory risk

The absence of a clear well established and autonomous regulatory framework can have adverse effects on the overall operating capabilities of a private operator. The regulatory risks arise mainly in circumstances where there is contractual non-compliance by either parties such as during the implementation of tariff adjustments which if delayed can render the contract non-viable. Therefore an independent and competent regulator is essential to safeguard the interests of both the consumers and the operators.

(iv) Environmental risks

These risks emanate from costs that can be incurred when there are unanticipated changes to the existing environmental standards and imposition of restrictions to the way proposed developments can be implemented. It is therefore absolutely necessary that a thorough and exhaustive diligence exercise is effected prior to contract implementation to avert occurrence of the same.

(v) Legal risks

The absence of an appropriate legal framework gives rise to various complex legal risks, which mainly hinge on;

- Extraction of water
- Distribution of water
- Dispute resolution

It is essential therefore that there are in place adequate and appropriate legislative instruments to cater for all of the above.

(b) Micro level risk

These are risks that are found at project level.

(i) Financing risk

The concept of private sector participation in the water and sanitation sector is a relatively new phenomenon in Sub-Saharan Africa. The worldwide markets for financing projects via the private sector in water supply and sanitation are not very well established due to low levels of experience encountered to date. This factor amongst others greatly exacerbates the likelihood of occurrence of this risk. It is therefore crucially important that provisions for loan security guarantees, contract termination and tariff adjustment are carefully structured and provided for in the contract document.

(ii) Construction risk

This risk rears itself in a variety of forms. These are;

- The cost of new developments or system renovations exceeding original expectations.
- The contractor's failure to complete the works on time.
- General poor performance by the contractor evidenced by poor quality of works produced.

Mitigatory measures include incorporation of financial contingencies to cover unforeseen events, imposition of liquidated and ascertained damages on the non performing contractor, insurance and building in excess capacity to the contract in order to protect against failure to attain optimal set targets.

(iii) Operational risk

This risk faced by both the government and operator, generally occurs during the operational phase (service provision stage). It is usually in the form of;

- Government interference in operations
- Reduction in availability of raw water from the source due to climatic and or socio-economic factors.
- Cost of raw water

Mitigatory measures include the following;

- Ensuring that management control of the operating company is invested in the private operator through award of controlling shares (i.e. minimum 51%)

- The drawing up of minimum performance standards with strict penalties for non and or poor performance.

(iv) Foreign Exchange risk

The stability and availability of foreign exchange is cardinal for smooth operations particularly in developing countries. A substantial portion of the operating costs is incurred in foreign currency that is through importation of treatment chemicals, equipment and dividend payments, whilst all the revenues are received in local currencies. The operator therefore should have un-hindered access to foreign exchange to facilitate operations (including debt service). The tariff adjustments should therefore promptly reflect changes in the foreign exchange rates so as to counter inflation and also to avert any likely compromise in the overall standards of service provision.

2.2.11 Water pricing, Tariffs and cross subsidies

One of the main areas of concern amongst consumers with regard to WSS service provision by any type of provider pertains to the price that they would be charged i.e. whether they (the consumers) will be able to afford and pay regularly for the services rendered. This position is exacerbated most especially when there is an imminent entry of the private sector to replace the public operator, who in majority of cases enjoys substantial government subsidies, which to a large extent are responsible for low and at times unrealistic tariffs.

Whittington and Boland (2000), define a tariff structure as, *"a set of procedural rules that determine the service conditions and charges for various categories of water users"*. The water bill is normally based on two main components namely;

- the volume of water consumed and
- other factors not entirely dependent on water use such as;
  - (a) value of property on which the connection is located
  - (b) subsidy of new connections and network expansion through a percentage levy which is imposed monthly

(c) part financing of service provision to the poor and low-income households through a percentage levy imposed monthly

(d) Value Added Tax (VAT)

2.2.11.1 Objectives of tariff design

Whittington and Boland (2000), state that the main objectives that a tariff should achieve in WSS service provision are;

- **Revenue sufficiency**

The adopted tariff should be able to achieve a particular pre-set revenue target. Most preferable scenario however is the attainment of full cost recovery, which ensures sustainability in operations.

- **Economic efficiency**

The tariff should create incentives for availing the maximum benefits to users at the minimal operating costs.

- **Equity and fairness**

The users should as far as possible, pay amounts proportionate to the costs that they impose on the utility.

- **Income redistribution**

In developing countries the water tariffs are used to redistribute income amongst various groups of consumers. This is achieved through the Increasing Block Tariff (IBT) approach, where the consumers in the low-income category are charged a life-line tariff based on a basic minimum monthly house-hold consumption whilst on the other hand, the large volume consumers (i.e. industries, large institutions, high income households etc) are charged at a much higher rate, which yields cross subsidies across divergent income groups.

- **Resource conservation**

The IBT approach can also act as a deterrent to excessive water use primarily to discourage wastage thus encouraging sustainable use of water.

2.2.11.2 Factors that need to be considered during tariff design

The following factors need to be considered prior and during the design of tariffs;

- **Public acceptability**

The tariff should be free from much public criticism and not stir up social upheavals.

- **Political acceptability**

The tariff should be able to garner support from the political leadership who in turn can facilitate its' acceptance amongst the consumers and other stakeholders.

- **Simplicity and Transparency**

The tariff should be easy to explain and understand. This will enable the users to understand what the tariff constitutes.

2.3 EMPIRICAL REVIEW

2.3.1 PSP experiences in developed countries

The Private Sector has participated in the service provision arena for water supply and sanitation to communities in several developed countries. Varied experiences have been encountered to date with unique differences emanating mainly due to;

- Variations in the specific national policies for each country and
- The economic policies of each government.

Hukka and Tapio (2003), state that, *"privatization, or more precisely public-private partnerships, were often introduced as a new cure for an old disease in the late 1890's and early 1900's"*. They further quote Bernard Wuolle, the Managing Director of the Helsinki Electricity Works in 1912 that, *"the first modern water systems were built on the basis of builder-owner or concession models in many European countries, and particularly in North America. In most cases, however, municipalities took over the water and sewerage systems rather rapidly."*

This scenario changed especially in England and Wales. Initially the private sector was fully responsible for WSS provision beginning in the 19th Century up to early 20th century. This format changed from private to public (local authorities) from the

beginning of the 20th century with heavy government subsidies. In 1974, the parliament decided to transfer responsibility to Regional Water Authorities (RWA), however 20 statutory private water companies serving about 25% of the populace, were allowed to operate side by side with the RWA's. Problems arose however with the RWA's as there were stringent restrictions on their borrowing capital desperately needed for operations. They were blamed by the Thatcher government for poor performance, which led to wholesome privatization. Table 2.11 below illustrates the different models adopted by various countries for WSS provision.

Table 2.11: Models of Public-Private Partnerships in Europe and Developing Countries

Finnish-Scandanavian-Dutch	Pluralistic	Regulated Municipal public monopoly	Private Sector participation for non-core operations
English-Welsh	Dualistic	Regulated regional private monopoly	Owner company's vertical intergration in non-core operations
French	Mayoral	Competition for regulated municipal monopoly rights	Operator company's vertical intergartion in non-core operations
Developing and transition economies	One Party system	Centralised unregulated public monopoly	Lack of private non-core service providers

Source: Assembled using data from Hukka and Katko from the Natural Resources Forum No. 27 (2003)

2.3.2 PSP experiences in Africa – Selected Cases

The private sector has participated in the provision of water supply and sanitation services in Africa for over three decades. This has happened in West Africa most especially. Vast amounts of experience have been gained also in the Energy and Telecommunications sectors too, though the lessons learnt from these sectors are not entirely applicable to the WSS sector, but are indicative of certain critical trends. Table 2.12 below shows examples of select PSP arrangements for WSS provision in Africa.

Table 2.12: PSP arrangements in for Water Supply and Sanitation in Africa

Management Contract	Lease
Gabon	Central African Republic
Gambia	Ivory Coast
Mali	Guinea
Uganda	South Africa
Zambia	Tanzania

Source: World Bank Technical paper No 337 (1997), "Privatizing Africa's Infrastructure-Promise and Challenge" Washington D.C. USA

The major lessons learnt in the WSS sector are similar in all the counties. Prime amongst these was the poor payment record by the public users (Government and State Owned Enterprises), which has had a negative impact on the quest to expand the networks in order to increase accessibility and also to foster general re-investment across the entire operational framework.

World Bank (1997a) states that, *"in Ivory Coast there was a substantial improvement in overall performance after engagement of a private operator"*. Gains were attained in service coverage, reduction in UFW, collection efficiency and staffing levels. However problems still arose through poor investment decisions by the government (which retained this responsibility) as there was little or no prior consultation with the private operator. Similarly in Guinea where there was a lease arrangement with a private operator, it was established that the government which accounted for over 40% of the utility's revenues did not pay its bills which led to the private operator withholding its payments to the state owned holding company. The resultant effect was little or no financing of investments, which adversely affected the overall operating performance of the utility.

2.3.3 PSP experiences in Zambia

The private sector has participated very minimally in the urban WSS sector in Zambia. It has been mainly in the form of *"service contracts"*, where specialized services such as;

- Installation of pumping equipment and accessories
- Refurbishing of the water and sewerage treatment plants
- Upgrading and refurbishment of delivery pipelines
- Construction and repairs to reservoirs
- Improvement of billing systems

There was a technical assistance contract funded by the German Government to the Lusaka Water and Sewerage Company from 1990 to 1996. This was in the form of advisory services in Finance, Corporate and Technical planning.

The first PSP contract is the one currently in place at the AHC-MMS company on the Copperbelt Province in Zambia. This is a "Performance Based Management Contract" of four years duration, from the year 2000 (further details are in Chapter 4.2.3).

2.3.4 Willingness to pay and Ability to pay

One of the prime issues that any private operator will consider before entering the service provision arena is information on the customers';

- "Willingness to pay" and
- Ability to pay for services received.

This is important in order to ascertain whether the operating costs can be fully (or partially) recovered. One contentious issue concerning the provision of services to the poor or low-income households is the generally held notion that, *"those from this category cannot shoulder a full cost recovering tariff, hence they would need to be subsidized"*.

In the report of the International Consultations on partnership in the Water Sector for Cities in Africa by the United Nations Centre for Human Settlements (Habitat) it is stated that, "low-income communities can afford and are willing to pay for the water services and often spend a much higher proportion of their income on water; a clear indication of their readiness to participate financially in the provision of these services". This statement needs to be underpinned by empirical evidence.

Whittington *et al.*(1989) presented the following findings;

Location	:	City of ONTISHA Nigeria
Population	:	700,000
No. of consumers on public water supply system	:	8000
No. of consumers on vending system	:	Majority (much greater than 8000)

	Public water supply system	**Vending System**
Volume of water supply in dry season	1.5m/gal/day	2.96million/gal/day
Total Revenue	$1100	$28000
Unit cost per day	0.07c/gal	0.95c/gal

- Vending provides double supply and 24 times as much revenue as the water utility.
- Vending cost is about14 times higher than public water supply system

A comparison on the differentials in the cost of water (i.e. ratio of price charged by water vendors to prices charged by public utilities) for a select sample of African cities was outlined in World Bank (1988) as shown in Table 2.13 below;

Table 2.13: Ratio of prices charged by water vendors to utility companies

CITY	RATIO
ABIDJAN	5:1
KAMPALA	4:1 TO 9:1

CITY	RATIO
LAGOS	4:1 TO 10:1
LOME	7:1 TO 10:1
NAIROBI	7:1 TO 11:1

- It is clear from the empirical evidence above that communities residing in peri-urban areas and those in the "low income" bracket (i.e. without access to piped facilities) pay at least 5 times more than those with such facilities. This gives credence to the assertion that there are many more consumers who are able to pay for the services rendered.

2.4 FRAMEWORK REVIEW

2.4.1 Socio-Economic framework

The successful implementation of PSP service delivery arrangements requires a clear understanding of the socio-economic operational environment. According to RSU (1999), Zambia is rated as one of the most highly urbanized countries in Africa with a rate of urbanization that is not in tandem with the rate of infrastructural development resulting in a situation where there is inadequate infrastructure to cater for the current population levels. Reasons for this scenario can be largely attributed to continually declining macro-economic performance principally as a result of fallen copper prices a trend which began in the 1970's.

2.4.1.1 Customer Base:

Recovery of operating costs for services provided is a factor that occupies a high level of importance and prominence amongst potential private sector service providers. Three household surveys to evaluate the poverty situation in Zambia were conducted between 1991 and 1996. These were;

1. Social Dimensions of Adjustments Priority Surveys I (1991)

2. Social Dimensions of Adjustments Priority Surveys II (1993)
3. Living Conditions Monitoring Surveys (1996)

Three poverty lines were established based on the cost of acquiring a basic "food basket" required for a minimum calorie level for a family of six. The three poverty lines were classified as follows;

1. **Extremely Poor:** Monthly income unable to purchase a "food basket" to meet the recommended calorie intake.
2. **Moderately Poor:** Monthly income enough to acquire the "food basket" plus an additional 30% for basic needs such as clothing and footwear, housing, education, education, health, transport and remittances to other households
3. **Non Poor:** Monthly income exceeding the cost of "food basket" and 30% for the additional basic needs.

Table 2.14 below illustrates the poverty classification on the national status of poverty in Zambia.

Table 2.14: Poverty classification and status of poverty in Zambia

Poverty classification	National	Urban	Rural
Extremely Poor	66	44	79
Moderately Poor	12	16	10
Total Poor	78	60	89
Non Poor	22	40	11

Source: CSO, 1999 Selected Socio-Economic indicators 1998

- About 66% of the urban populace is classified as poor and are barely able to meet their basic household requirements.
- At least 44% of the urban population will not be able to meet their minimum food requirements implying that they would not be able to pay for fully cost recovering tariffs which a private operator would effect

2.4.1.2 Peri Urban Areas:

These are areas that have become a prominent feature in Zambia's urban landscape. They usually begin as illegal, unplanned and un-serviced settlements which are devoid of basic services such as water supply and sanitation, roads, drainage and power. The bulk of the urban population resides in these settlements. In order to provide minimum basic water supply and sanitation services, large capital investment interventions would be required. However, there is the challenge of cost recovery for investment interventions that may be undertaken due to the inability by some to afford the services provided. This assertion stems from the current high levels of unemployment amongst household heads and low average wages.

2.4.2 Policy framework

In 1994, the Government of Zambia (GRZ) adopted the National Water Policy document as a prelude to water sector reforms. The main rationale behind this was to bring about a more holistic approach in the overall management of entire water sector. The overall objective of the National Water Policy is:

"To promote sustainable water resources development with a view of facilitating an equitable provision of adequate quantity and quality of water for all competing users at acceptable cost and ensuring security of supply under varying conditions. This entails establishing a well defined institutional structure that will achieve the intended policy objectives."

For Urban Water Supply and Sanitation (UWSS), this policy seeks to address the following issues;

- Maintaining strategic reserves or stockpiles of water treatment chemicals
- Implementation of a well planned delinkage of water resources management from water supply and sanitation management
- Development and implementation of a National Water Conservation Strategy
- Creation of an autonomous body to review and oversee the tariff structure of the UWSS sector

- Providing sufficient central government grants for operation and maintenance of UWSS schemes
- Encouraging investment in the rehabilitation of UWSS schemes
- Carrying out investigations regarding regionalisation of operations and management of UWSS schemes
- Formulating a well articulated training programme which addresses basic needs of the UWSS sector
- Enacting and enforcing council by-laws and other existing pieces of legislation to prevent water pollution
- Establishing a water sector devolution trust fund to assist the transformation of local urban water and sanitation operations into commercial enterprises
- Ensure that water tariffs take account of all economic costs

This policy is based on seven principles namely:

- Separation of water resource management from water supply and sanitation provision
- Separation of Regulatory and Executive functions
- Devolution of authority to local authorities and private enterprises
- Full cost recovery in the long run (with lifeline tariffs and cross subsidy)
- Human resource development resulting in more cost effective institutions
- Technology appropriate to local conditions
- Increase government priority and budget to the sector

This policy resulted in the enactment of the Water Supply and Sanitation Act (1997) and the formation of the Water Resources Action Program (WRAP).

2.4.3 Legislative framework

The following legislative instruments relate to WSS provision in Zambia.

The Water Act

The Water Act is the supreme law on water resource issues in Zambia. It dates from 1949 with amendments incorporated in 1964. It provides for the ownership of water and

procedures for authorization and invalidation of water use. The ownership of all water is vested in the President, on behalf of all the people of Zambia.

It defines public and private waters and outlines the conditions under which water may be abstracted for use in urban water supply. It also establishes the Water Development Board (WDB), which is the authorizing entity for water use throughout the country. It also states the punitive measures to be taken against any person who pollutes public waters so as to make it harmful to man, beast, fish or vegetation.

The Water Supply and Sanitation Act

The Water Supply and Sanitation Act No. 28 of 1997 provides for the efficient and sustainable supply of water and sanitation services. The Act empowers local authorities to provide such services through commercial utilities or private service providers and establishes an independent regulator. Statutory instrument No. 63 of 2000 determines regulations for licensing utilities and service providers.

The Act also establishes the independent regulator, the National Water Supply and Sanitation Council (NWASCO). It reports to the National Assembly through the Minister of Energy and Water Development.

The Environmental Protection and Pollution control Act

The Environmental Protection and Pollution control Act No. 12 of 1990 establishes the Environmental Council of Zambia (ECZ). The other main objectives of this Act are;

(1) To set provisions for the protection and control of pollution

(2) To prescribe the functions of the council

(3) To provide for matters connected with or incidental to the Act, covering water, air, waste, pesticides and toxic substances, noise, ionizing radiation and natural resource conservation

The Local Government Act No. 22 of 1991

It is gives the local authorities the prime responsibility to provide water and sanitation services to all areas within their jurisdiction.

The Standards Act of 1994

The Zambia Bureau of Standards established under the standards act is responsible for the publishing (not setting) the water quality

The Investment Act of 1995

It was enacted to revise the law relating to investment in Zambia so as to;

- Provide a comprehensive legal framework for undertaking investments in Zambia
- To repeal the Investment Act of 1991

The Act indicates among other issue the qualification for special incentives and exemption from duty and VAT.

The Privatisation Act of 1995

This Act was enacted to provide for;

- Privatisation and commercialization of state owned enterprises
- The Establishment of the Zambia Privatisation Agency and to define its functions
- The sale of shares in state owned enterprises
- Matters connected with or incidental to the foregoing

The Companies Act of 1995

This Act was enacted to provide for;

- The formation, management, administration and winding up of companies
- The registration of foreign companies conducting business in Zambia

2.4.4 Institutional framework

Table 2.15 below outlines the distribution of water management and associated issues amongst various Government Ministries in Zambia;

Table 2.15: Allotment of Water related functions amongst GRZ Ministries

Organisations	Activities and responsibilities (Water related)
Ministry of Energy and Water Development	• Water resources development and management • Liason with the National Water Supply and Sanitation Council (NWASCO) • Liason with the Water Development Board (WDB) • Liason with the Water Resources Action Programme (WRAP)
Ministry of Environment and Natural Resources	• Environmental protection and pollution control • Liaison with the Environmental Council of Zambia
Ministry of Local Government and Housing	• Co-ordination of Local Government administration which includes public water utilities through the Department of Infrastructure and Support Service • Resource mobilization
Ministry of Finance and National Planning	• Capital funding through the Ministry of Local Government and Housing
Ministry of Health	• Promotion of an environment that is conducive to good health

2.4.5 Regulatory framework

Several specialized bodies and Government departments empowered by legislative instruments govern regulation in the Water Supply and Sanitation sector in Zambia. The institutions that are responsible for the regulatory functions are;

- The National Water Supply and Sanitation Council (NWASCO)
- The Environmental Council of Zambia (ECZ)
- The Local Authorities
- The Water Development Board
- The Ministry of Health

2.4.5.1 National Water Supply and Sanitation Council (NWASCO)

The National Water Supply and Sanitation Council was established by the Government of Zambia after passing the Water Supply and Sanitation Act No. 28 of 1997 and became fully operational in October 2000. This Act provides for the establishment by local authorities, of water supply and sanitation utilities and to provide for the efficient and sustainable supply of water and sanitation services under the general regulation of NWASCO.

NWASCO's main functions are to;

- Advise Government and local authorities on all issues affecting water and sanitation and on institutional arrangements such as the establishment of Commercial Utilities and Private Sector Participation.
- Licence all service providers
- Issue guidelines and set performance standards
- Approve tariff adjustment proposals and negotiate tariff adjustment agreements
- Monitor the performance and activities of the providers
- Promote sector development in line with the sector policy of the Government
- Disseminate information to consumers and report to Government

2.4.5.2 Environmental Council of Zambia (ECZ)

The Environmental Protection and Pollution Control Act No. 12 of 1990 establishes the ECZ. The ECZ, is an advisory and regulatory body for environmental protection and pollution control. In the WSS sector the regulatory aspects relate to monitoring of pollution of water bodies and, toxicity levels of effluent discharge after treatment in the sewage plants.

2.4.5.3 Local Authorities

In part 3 of the WSS Act No. 28 of 1997 it is stated that, *"a local authority may resolve to establish a water supply and sanitation utility as a company under the Companies Act as follows"*;

(a) as a public or private company

(b) as a joint venture with an individual or with any private or public company

(c) as a joint venture with another local authority or several other local authorities

It follows therefore that the local authority will be expected to regulate the operations of the company formed, by virtue of being a shareholder. There also is the Public Health Act. which *"provides for the prevention and suppression of diseases and generally regulate all matters concerned with public health in Zambia"*. In Part IX – Water and Food Supplies, it is the duty of local authorities to take all lawful, necessary and reasonably practicable measures for preventing any pollution to any supply of water which is for public use.

2.4.5.4 Water Development Board

Established by the Water Act (in Part IV). One of its main regulatory roles is to consider applications for water rights and thereafter grant or refuse the same. It also determines and effects the charges for water extracted and prescribes and monitors the total volume of water extracted by a utility from a water source.

2.4.5.5 The Ministry of Health

Monitors water quality (pollution levels) through the Central Board of Health and Public Health Departments in the Local Authorities under the Public Health Act.

CHAPTER THREE

3. APPROACH AND METHODOLOGY

3.1 GENERAL APPROACH

In order to achieve the objectives of this research, several research processes and tools were used. Both primary and secondary data were collected using qualitative and quantitative techniques described in detail in sections of this chapter.

3.1.1 Quantitative analysis

The information collected using this research method can be expressed using numerical measures. In this study, data on aspects such as performance indicators, levels of service and cost of services provided were arrived at using this format.

3.1.2 Qualitative analysis

This process examines human behaviour in the social, economic, cultural and political contexts in which they occur rather than numerical analysis. The problem solving technique here is mainly inductive. Salkind (2003) states that, *"the general purpose of qualitative research methods is to examine human behaviour in the social, cultural and political contexts in which they occur"*. He further states that the collection of data is done through a variety of tools such as interviews, historical methods, case studies and ethnography finally yielding qualitative primary data.

The research methodology was in five parts namely;

- The desk research (literature review)
- Observational Research (field studies)
- Semi-structured interviews
- Development of the PSP models
- The validation questionnaire

3.2 THE RESEARCH METHODOLOGY

3.2.1 The Desk Research

This involved the study, review and analysis of relevant published literature ranging from relevant books, published articles, journals, government reports, contract documents, archival records and on line publications found on the World Wide Web (WWW). These sources of information gave descriptive data about the organisations being investigated ranging from organisation charts, service delivery options, service level indicators, budgets, capital funding mechanisms and other experiences encountered world wide. A review of the legislative instruments in use was also conducted primarily in order to ascertain their effect on all types of service provision arrangements.

3.2.2 Case Studies

The "case study" research tool is a method used to study an individual or an institution in a unique setting or situation in as intense or detailed manner as possible (Salkind, 2003). Powell (1993) defines a case study as a qualitative research method whereby particular phenomena are investigated without significant interventions of the investigator.

3.2.2.1 Selection of case studies and the sampling unit

The selection criteria for the case studies were based on the purposive sampling concept. Leedy and Ormond (2001), states that, *"in purposive sampling, people or other units are chosen, as the name implies, for a particular purpose"*. In this research four cases were selected. Three of the four cases have adopted PSP for service provision namely;

(i) National Water and Sewerage Corporation (NWSC), Uganda, providing services to the city of Kampala

(ii) Dar Es Salaam Water and Sewerage Authority (DAWASA), Tanzania, providing services to the city of Dar Es Salaam

(iii) Asset Holding Company Mining Munincipal Services (AHC-MMS), Zambia, providing services to the former mining areas in the Copperbelt province of Zambia.

The fourth case namely;

(iv) Lusaka Water and Sewerage Company, Zambia, providing services to the city of Lusaka

has not yet (by January 2004) adopted any PSP option. These four cases represent the sampling unit of this study.

The appropriateness of this selection criteria stems from the many similarities that exist between the cases being compared. These range from the historical, political, socio-economic, institutional, legislative, regulatory, operational and management experiences. It was strongly envisaged that, the data collected from the three cases that had already implemented a PSP arrangement for service delivery once subjected to a comparative analysis process, would accurately facilitate the identification and subsequent enumeration of the opportunities and constraints of PSP in Zambia's water supply and sanitation industry. The findings from the selected cases were subjected to a "comparative analysis" (see Chapter 3.2.2.4).

3.2.2.2 Observational Research

This is the most basic of the market research techniques used to obtain primary data. This component consisted primarily of tours to water and sewerage treatment plants and other associated infra-structure in order to gain a clearer understanding of the service delivery processes. This stemmed out of the realization that, sensible and realistic interpretation of data can only be achieved once a proper understanding of the operational framework has been attained. Attention was also given to service delivery mechanisms in the peri-urban areas where there are currently extremely low levels of accessibility to water supply and sanitation services.

3.2.2.3 Interviews

The interviews were conducted using a "semi structured" layout, which consisted of pre - set questions. The interviews were recorded to enhance on accuracy of information collected. Interviewees consisted of senior management officials drawn from the financial, corporate planning, human resource, technical, operational and maintenance

departments of all the organisations selected. Others consisted of key officials drawn from;

- the bilateral and multilateral funding institutions
- the policy, legislative and regulatory arms of the government of Zambia

3.2.2.4 Comparative analysis

This research tool was used to compare and contrast the situations on various aspects of the service delivery process amongst the cases selected with the ultimate objective of identification of the opportunities and constraints that are inherent for private sector participation in Zambia's water supply and sanitation sector. The main focus during this form of analysis is on, how the situations being compared relate, corroborate, complicate, contradict, correct or debate one another.

The "Lens" (or keyhole) comparison was used in this study whereas situation "A" acted as a lens through which to view situation "B". Walk (1998) stated that, *"lens comparisons are useful for illuminating, critiquing or challenging the stability of a thing that, before the analysis, seemed perfectly understood. Often lens comparisons take time into account: earlier texts, events, or historical figures may illuminate later ones, and vice versa"*. In this study the "lens" are the cases that have already adopted PSP for service provision whilst the "focal point" is the case which has not yet adopted PSP for service provision.

3.2.2.5 Modelling and the Decision Tree

The recommended PSP option for the City of Lusaka, Zambia was developed using the "Decision Tree" concept. This process helps to arrive at an informed decision using the "Flow Chart" which simplifies the understanding of relationships amongst the key variables in a particular process.

The Flow Chart is defined as a *"pictorial representation describing a process being studied or even used to plan stages of a project. Flow Charts tend to provide people with a common language or reference point when dealing with a project or process"*. The events that are represented on a Flow Chart follow a chronological systematic sequence that is unambiguous and clear to understand.

There are several types of flow charts that can facilitate a decision making process. In this study, the "Process flow chart" in conjunction with the "Process flow description chart" were used. Hansen (2004) describes these processes as follows;

(i) Process flow chart: A chart used to describe the sequence and relationships of the tasks that make up an activity.

(ii) Process flow description chart: A detailed description of the tasks outlined in a process flow chart. Typically used to illustrate the kinds of tasks performed within a process, the number of operations, review and transfers, and the amount of time required to complete an activity.

3.2.2.6 Questionnaire design, administration and validation

The questionnaire is defined in Webster's New Collegiate Dictionary as *"a set of questions for submissions to a number of persons to get data"*. The rationale in this stage of the data collection process, was primarily to test the applicability and appropriateness in the Zambian context of the PSP models developed and to ascertain whether they addressed the key issues that have adversely affected the overall performance of this sector. The questions contained in the questionnaire were the "open-ended" type, which are designed to solicit free responses from the participants.

This stage in the study pursued the following process;

(i) The questionnaire and the PSP models formulated were sent to several senior practitioners in the water supply and sanitation service sector in Zambia for their comments.

(ii) Their responses were incorporated in the final findings of the study.

CHAPTER FOUR

4. FINDINGS

4.1 GENERAL FRAMEWORK

Implementation of Private Sector Participation type contract arrangements in any country requires enabling government policies, legislation, institutional arrangements and regulatory practices to be in place. Furthermore, the overall socio-economic environment must have the capacity to sustain such a service arrangement. Some of the key factors that need careful scrutiny are;

- the size of the potential market
- the ability of customers to pay for services received and
- the will on the part of government to strictly adhere to the terms and conditions outlined in the PSP contracts.

In Zambia's urban water supply and sanitation sector, government has over the years attempted to effect transformations in the sector with the ultimate objective of improving the overall performance. These changes, however, have not necessarily been prompted by a desire to create enabling conditions for PSP per se, but primarily to enhance operational efficiency and increase levels of access to services by communities which if attained in some measure, would contribute immensely to poverty reduction. According to GRZ (2000), poverty is defined as, "*lack of access to income, employment opportunities, normal internal entitlements for the citizens to such things as freely determined consumption of goods and services, shelter and other basic needs of life*".

This chapter attempts to provide an integrated summary of the main socio-economic, policy, legislative, institutional and regulatory factors that may substantially affect, influence and have a significant impact and bearing on the participation of the private sector in Zambia's urban water supply and sanitation sector.

4.1.1 Socio-Economic framework

Upon attainment of independence in 1964, the government of Zambia under the leadership of President Kenneth Kaunda gave utmost priority to the correction of the social imbalances that were inherent during the colonial era. This was done through construction of educational facilities, health infrastructure, housing, roads, and water supply and sanitation infrastructure financed mainly from the abundant foreign exchange reserves that were inherited from the colonial administration. However according to World Bank (2002), Zambia now ranks amongst the poorest and most highly indebted countries in the world with an external debt of about US $ 6.3bn and nominal GNP per capita falling from US$ 630 in 1980 to US$ 540 in 1990 and US$ 300 in the year 2000.

The root causes of Zambia's poor economic performance are attributable to several factors namely economic, social, and political mismanagement, compounded by external factors. For most part of the post independence era, Zambia pursued a mono type economy which heavily depended on revenues received from copper mining. Her plentiful foreign exchange reserves began to diminish when the price of copper fell in the 1970's exacerbated further by the sudden rise of oil prices due to the then Middle East crisis. Consequently, mining, the main driving force in the Zambian economy experienced a continuous downward trend for a long period primarily due to;

- lack of re-investment capital and
- the non-adherence to strict commercial operating principles after nationalization of the sector by government.

This scenario impacted negatively on net government revenues and the sectors that heavily depended on the mining industry.

Furthermore, several key macroeconomic variables such as inflation, foreign exchange rates and interest rates began to develop a continuously negative downward trend, which indicated that the overall macro-economic performance of the country was well below satisfactory levels and impacted negatively on Zambia's external image as an attractive destination for foreign direct investment.

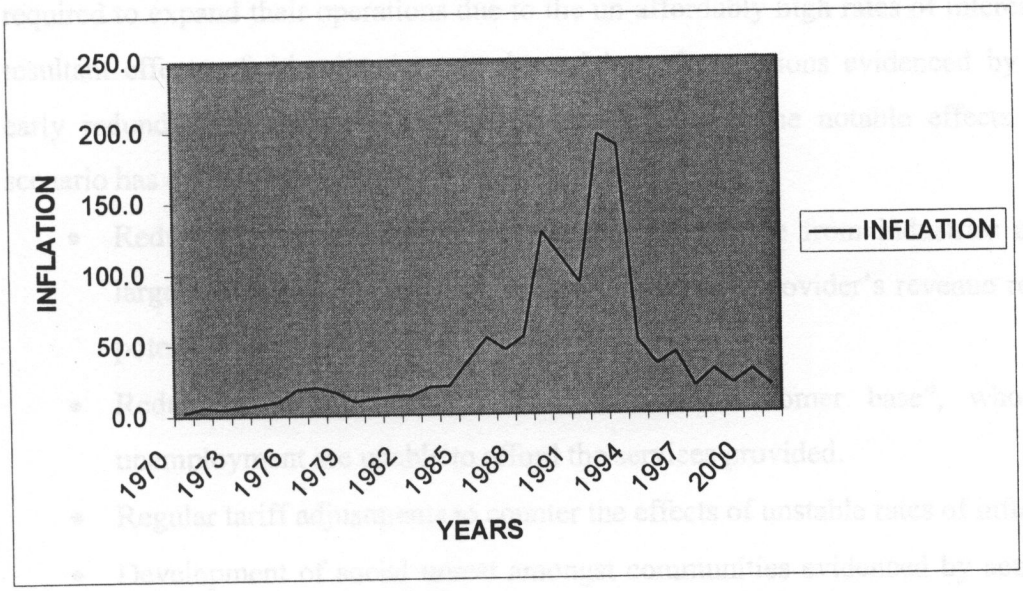
4.1.1.1 Social factors

There are several social factors that have a significant bearing on the implementation of a PSP service arrangement. In Zambia the major influencing factors range from affordability of the service in relation to the income bands of the serviced population, size of the market and the extension of the service to the "un-served", who are mainly those who reside in the so called informal settlements. It has already been outlined in Chapter 2 that, over 60% of the urban population is classified as poor and would hence be unable to afford services at fully cost recovering tariffs, *as they presently cannot even cater for* their minimum daily food requirements. It is therefore vital that introduction of PSP is consistent not only with the realization of efficiency enhancing objectives, but also in facilitating the achievement of social and political objectives as regards provision of service to the poor.

4.1.1.2 Treasury Bills, Inflation and Interest Rates

Zambia has experienced severe macro economic instability over the last decade due to a variety of reasons. In the early 1990's the government in an effort to eradicate excess money supply which was fueling inflation, decided to issue treasury bills for purchase by the business community and public at large. The intended benefits of this exercise were not fully realized as government began to use the money collected to finance recurrent expenditure, implying that the excess money siphoned out was immediately re-injected back into circulation with no resultant reduction in inflation. Fig 4.1 below shows inflation trends in Zambia from 1970 to 2000.

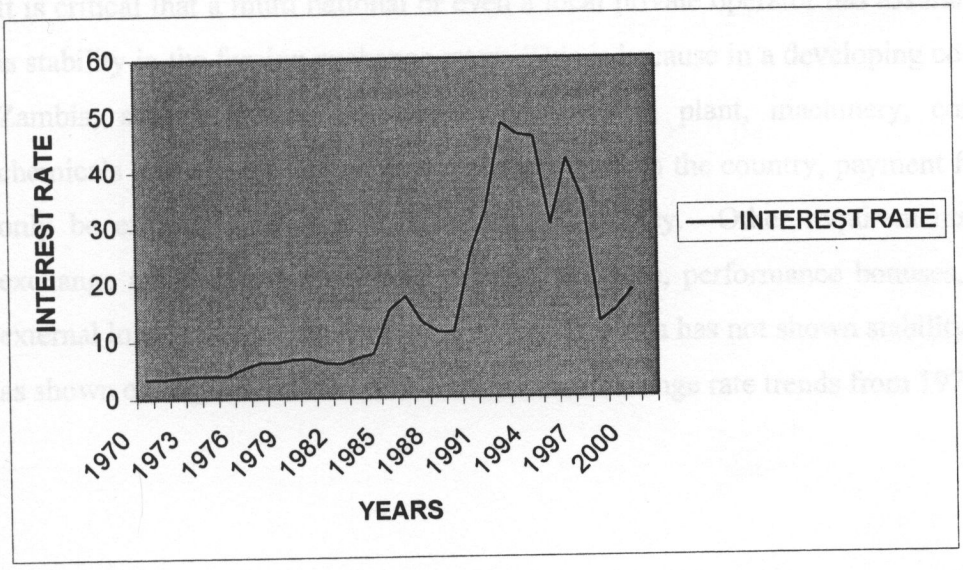
Fig No 4.1: Inflation Trends in Zambia 1970 to 2000 (% per annum)



Source: IMF, International Financial Statistics yearbook 1993 -2000

When the rate of inflation rises there is a corresponding increase in the interest rates. Fig 4.2 below outlines the interest rate trends in Zambia from 1970 to 2000.

Fig 4.2: Interest Trends in Zambia 1970 to 2000 (% per annum)



Source: IMF, International Financial Statistics yearbook 1993 -2000

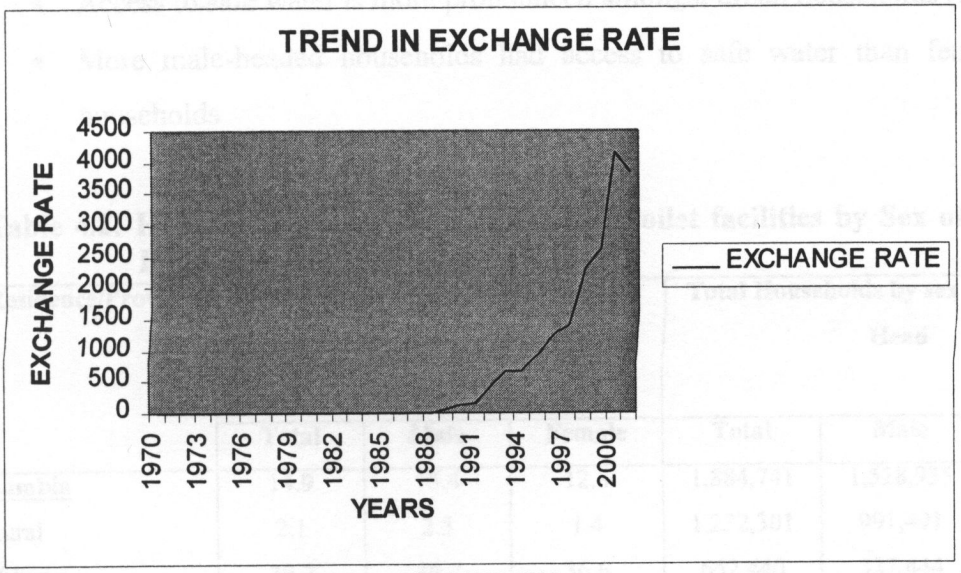
This scenario inhibits growth from taking place in the economy. Consequently businesses suffer from under capitalization as they fail to realise the much needed capital required to expand their operations due to the un-affordably high rates of interest. Some resultant effects of this situation are downsizing of operations evidenced by lay-offs, early redundancies and even closure of businesses. Some notable effects that this scenario has on the water supply and sanitation sector are;

- Reduction in consumption and demand for service from industries and other large commercial users which affects the service provider's revenue realization potential negatively.
- Reduction in numbers of the "individual customer base", who due to unemployment are unable to afford the services provided.
- Regular tariff adjustments to counter the effects of unstable rates of inflation.
- Development of social unrest amongst communities evidenced by actions such as consumer boycotts, vandalism of the network infrastructure, illegal connections, physical threats and intimidation of the utility staff, as more and more people are unable to afford the service.

4.1.1.3 Foreign Exchange stability

It is critical that a multi national or even a local private operator has assurance that there is stability in the foreign exchange rates. This is because in a developing country such as Zambia, almost all the inputs such as physical plant, machinery, computer-ware, chemicals etc. are most often than not imported into the country, payment for which can only be effected in a convertible foreign currency. Other requirements for foreign exchange are for the payment of management fees, performance bonuses, servicing of external loans and externalization of profits. Zambia has not shown stability in this arena as shown on Fig 4.3 below which outlines the exchange rate trends from 1970 to 2000.

Fig 4.3: Exchange Rate Trends in Zambia from 1970 to 2000 (Kwacha against the US dollar)



Source: IMF, International Financial Statistics yearbook 1993 -2000

The overall access (at a macro level) to water supply and sanitation services in Zambia needs to be increased drastically, though the overriding negating factor that shall hinder this objective, is the high prevalence and incidence of poverty amongst the majority of those to whom this accessibility increase ought to be availed. Tables 4.1 and 4.2 below, illustrate the access levels to water supply and sanitation services respectively as of 2000.

Table 4.1: Households with Access to Safe Water by Sex of Household Head, Zambia 2000

Residence/Province	Households with access to safe water by sex of Household Head (%)			Total Households by sex of Household Head		
	Total	Male	Female	Total	Male	Female
Zambia	49.1	49.5	47.3	1,884,741	1,528,935	355,806
Rural	29.5	29.5	29.4	1,232,301	991,491	240,810
Urban	86.1	86.4	84.6	652,440	537,444	114,996

Source: Zambia Census of Population and Housing, 2000

From Table 4.1 it can be inferred that;

- Less than half of the total population has access to safe water.
- Sources of safe water are from protected wells, protected boreholes and taps.

- Sources of unsafe water are unprotected wells, unprotected boreholes, lakes, rivers, streams, dams.
- Access to safe water is more pronounced amongst urban households (86.1%).
- More male-headed households had access to safe water than female headed households

Table 4.2: Households with Access to Proper Toilet facilities by Sex of Household Head, Zambia 2000

Residence/Province	Households with access to proper Toilet facilities by sex of Household Head (%)			Total Households by sex of Household Head		
	Total	Male	Female	Total	Male	Female
Zambia	14.9	15.4	12.8	1,884,741	1,528,935	355,806
Rural	2.1	2.3	1.4	1,232,301	991,491	240,810
Urban	39.2	39.8	36.6	652,440	537,444	114,996

Source: Zambia Census of Population and Housing, 2000

- Access to proper toilet facility refers to access to flush toilet (whether private or communal), and ventilated improved pit latrines. The other toilet facilities, i.e. pit latrine and bucket are regarded as improper toilet facilities.
- Only 14.9% have access to proper toilet facilities in Zambia, implying that the levels of good sanitation are very low.
- Only 39.2% of the urban households have access to proper toilet facilities

Therefore, it can be inferred from Tables 4.1 and 4.2 that, access to high standard water supply and sanitation facilities in Zambia is inhibited primarily by the economic status of the majority of the population. In Chapter 2 section 2.4.1 an illustration of the poverty classification for Zambia was stated and that over 60% of the population are very poor. This category cannot afford to acquire the basic minimum "food basket" requirements and other needs such as clothing, good housing, foot ware, health and education.

For following are some common examples;

(i) The construction of a good quality latrine such as the Ventilated Improved Pit Latrine (VIP) requires usage of concrete blocks/bricks, a vent pipe, a reinforced concrete platform etc., which cannot be easily afforded by most individual households.

(ii) The connection cost for an individual plot connection in the peri-urban areas is well beyond the reach of most households. This leaves them with no option but to source for their water needs from high risk sources such as hand dug wells (in close proximity to pit latrines), open streams exposed to high levels of pollution and procurement of water by the commonly used 20litre jerry can from the few who can afford the household connections, but at a cost at least 5 times higher than the service provider's applicable tariff.

However, this scenario does not imply that there is no need to extend the service to this category of potential consumers. Adoption of more appropriate mechanisms from both a technological and commercial point of view is inevitable. These mechanisms are discussed in more detail in Chapters Five and Six.

4.1.2 Policy framework

Zambia's Water Policy is essentially aimed at, *"promoting a sustainable water resources development with a view to facilitate an equitable provision of adequate quantity and quality of water for all competing groups of users at acceptable costs and ensuring security of supply under varying conditions"*.

The National Water Policy (NWP), adopted in November 1994, sought to bring about a more coherent approach for planning, management and development of water resources. It has been recognized that water plays an important and vital role in the overall economic development of the country and the subsequent improvement in the quality of lives of the national populace. The former arrangement in which the NWP was administered through a Ministerial policy statement titled "Construction, Maintenance and Operation of Public Water Supplies" of December 1974, was found to only contain principles which were used to address development projects that were often

uncoordinated and lacked sustainability (GRZ, 1994). This to date, is evidenced by the current high prevalence of severely deteriorated physical infrastructure coupled with the very low levels of service delivery and access to water supply and sanitation by majority of the population.

One major output of the NWP was the adoption of the "seven sector principles" by the Government of Zambia. Table 4.3 shows an evaluation on how each of these principles has been implemented so far.

Table 4.3: Evaluation of the Seven Sector Principles in the NWP

Sector Principle	Comments
Separation of water resource functions from water supply and sanitation	• Water supply and sanitation function moved to local authorities who can form Commercial Utilities. • Department of Water Affairs to concentrate on water resources development and management. • Problems still encountered on transfer of assets from Local Authorities to Commercial Utilities
Separation of regulatory and executive functions within the WSS sector	• GRZ created NWASCO as the main regulatory body complemented by ECZ, Local Authorities and the Water Board • Executive functions were devolved to the Local Authorities
Devolution of authority to Local Authorities and private enterprises	• Legislation effected that provides for the transfer of WSS functions to Local Authorities. • Autonomy availed to the Local Authorities in matters of finance, investment and human resources • Problems still exist on payment of severance packages for inherited staff • Role of Small Scale Independent Providers and NGO's needs further clarity
Achievement of full cost recovery for the WSS services (capital recovery, operation and maintenance) through user charges in the long run	• Tariffs being gradually increased so as to attain full cost recovery status in the long term • Poor macro-economic performance has affected affordability of services. • Capital still required to replace defective infrastructure components such as meters, pipe work and billing systems
Human resource development leading to more effective institutions	• Short term training courses are conducted nationally under the auspices of various NGO's and bilateral funding agencies. • Degree, Technologist, Technician and basic artisan training available under

Sector Principle	Comments
	the auspices of the Universities and the National Technical Training Authority. • Holistic approach still absent and needs to given consideration.
Technology appropriate to local conditions	• Some standards have been set under the auspices of N-WASHE for basic equipment, latrines and under NWASCO for water meters and kiosk booth. • More standard setting still required on other WSS infrastructure. Key stakeholders should be consulted and involved during the problem identification and solution stages.
Increased GRZ spending priority and budget spending to the sector	• Funding has been erratic compounded with a poor payment record by government departments and other government funded institutions, which have an adverse effect on the operations of the Commercial Utilities or Local Authorities.

The National Water Policy does not adequately address the issues that concern sanitation. The main focus was on 'increased access to water supply' and 'improved water resource management'. Sanitation was treated more as an 'appendage' to the many water supply issues and not as an issue that stands alone requiring specific attention. In GRZ 1997b, it is stated that the National Environmental Sanitation Strategy objective is to, *"create an enabling environment with support mechanisms to facilitate individuals, households and communities to effectively improve their environmental sanitation conditions and hygiene practices to prevent the transmission of disease"*. Some factors that have affected the realization of this objective are;

(i) A general lack of awareness at all levels of the cost to the nation and to the individual of not having good environmental sanitation and appropriate hygiene behaviour.

(ii) Little attempt to enforce the regulations that exist on environmental sanitation and the requirement of householders and prospective developers to provide sanitary facilities.

(iii) Uncontrolled solid waste disposal which eventually contaminates fresh water sources.

The Government of Zambia in effecting this new policy framework had as its prime objective the bringing to the fore of a much more coherent and sustainable service delivery arrangement. In GRZ (1994) it was acknowledged that, of the investments made in water supply and sanitation schemes throughout the country, 90% emanated from donors and other cooperating partners, a situation which is obviously not sustainable. Furthermore, it was realized that water plays an important part in augmenting the standards of living of the population and ensuring more bearable living conditions of existence. Hence, it was imperative that measures are taken to ensure that water does not hinder the sustainable national development effort (GRZ, 1994).

From Table 4.3 it can be inferred that the NWP objectives have not been fully realized due to poor implementation on the part of government. Some of the objectives appear to be unrealistic such as that of "increased government spending" as it is directly dependent on factors that pertain to overall macro-economic performance. Carter and Howsam (1998) stated that, *"even the most brilliant policy making will fail if implemented badly and vice versa"*. They further argued that, *"policy guidelines have implications not only for those implementing water and sanitation programmes, but also for the legal and institutional framework which facilitate implementation"*.

4.1.3 Legal framework

Examination of the several legal instruments that govern urban water supply and sanitation in Zambia reveals various aspects that need review in order to erase ambiguities on issues of cardinal importance. The most prominent legal instrument pertaining to implementation of "PSP type contracts" in Zambia, is the Water Supply and Sanitation Act No. 28 of 1997 which states that, *"a local authority may resolve to establish a water supply and sanitation utility as a company under the Companies Act as follows:*

(a) as a public or private company;

(b) as a joint venture with an individual or with any private or public company;

(c) *as a joint venture with another local authority or several other local authorities*

provided that the majority shares shall be held by the local authority".

Other legal instruments are;

(i) The Water Act (CAP312)

(ii) The Environmental Protection and Pollution Control Act (CAP 204)

(iii) The Local Government Act (CAP 281)

(iv) The Town and Country Planning Act

(v) The Statutory Housing and Improvement Areas Act

(vi) The Public Health Act (CAP295)

Table 4.4 outlines the various legal instruments that govern Zambia's water supply and sanitation sector.

Table 4.4: Legal instruments and their provisos in Zambia's water supply and sanitation sector

Act	Proviso	Comments/Findings
Water Supply and Sanitation Act No 28 of 1997	• Establishes the Regulatory Authority who licenses and regulates service providers • Empowers Local Authorities to provide water supply and sanitation services through commercial utilities.	• Does not adequately cater for Concession and BOOT type PSP arrangements. • Appeals when disputes arise are to be made to the Minister, who may not be impartial. • Membership of NWASCO board too large and the number of members from the public sector should be reduced.
The Water Act	• Supreme law on water resource issues in Zambia. • Establishes the Water Board which issues water abstraction rights.	• Reforms under the auspices of the MEWD currently underway to develop a new legal and institutional framework for water resources management in Zambia.
The Environmental Protection and Pollution control Act	• Establishes the Environmental Council of Zambia (ECZ).	• Limited capacity and presence at district level nationwide of the

Act	Proviso	Comments/Findings
	• Sets provisions for the protection and control of pollution	enforcing agent ECZ which leads to poor enforcement of the provisos in this Act.
The Local Government Act	• Prescribes functions to Local Authorities for planning, development, and provision of munincipal services	• Gives responsibility of provision of water supply and sanitation services to a Local Authority
The Town and Country Planning Act	• Gives guidelines for land use patterns and developments in all areas. • Gives authority to the Minister to manage developments in all areas under the jurisdiction of Local Authorities.	• Has not been strictly enforced nationwide, resulting in a massive proliferation of unplanned settlements to which service providers are unwilling to extend services to.
The Statutory Housing and Improvement Areas Act	• It provides for the Minister to recognize unplanned settlements to exist in their current state.	• Enables for the recognition of unplanned settlements which can enable a service provider to extend the network.
The Public Health Act	• Places liability of monitoring water quality on the Local Authorities. It is enforced by inspectors from the Ministry of Health and the Public Health Departments in the Local Authorities.	• Severe inability to discharge the responsibilities primarily due to lack of resources.

4.1.4 Institutional framework

The water sector reforms that were effected by government in the early nineties resulted in the re-allocation of responsibilities amongst the key players in the sector the major one being government whose role has transformed from that of being a provider and implementer of programmes to that of a facilitator.

The WSS Act No 28 of 1997 gives local authorities the overall responsibility for provision of water supply and sanitation services to communities. There are four main options available namely;

- A local authority may through its Engineering Services department provide the service directly
- As a joint venture with other local authorities through formation of a commercial utility
- As a joint venture with the private sector through equity sharing. This venture is however limited to a maximum of 49% ownership by the private sector.
- Through contracting out of the all or portions of the service provision functions to the private sector. This can be in any of the following forms namely, management contracts, lease, concession, BOOT, BOT etc.

The responsibility for service provision for water supply and sanitation services to communities lies primarily with the local authorities as stated in the WSS Act No. 28 of 1997 Part 3 section 10. The overall operational framework for these local authorities is outlined in the Local Government Act No. 22 of 1991. It therefore follows that the strategic decision making process is vested in the body of councilors, who are elected representatives serving the council on a part time basis. There are several major challenges with this approach that need redressing in order to enable the entire institutional framework to be more responsive and act as a better catalyst to ensure a more wholesome transformation in the sector.

Fig 4.4 below illustrates the various institutions and the relationships between the key players in the water supply and sanitation sector in Zambia.

Fig 4.4: Organisational relationship between various key players in Zambia's urban water supply and sanitation sector

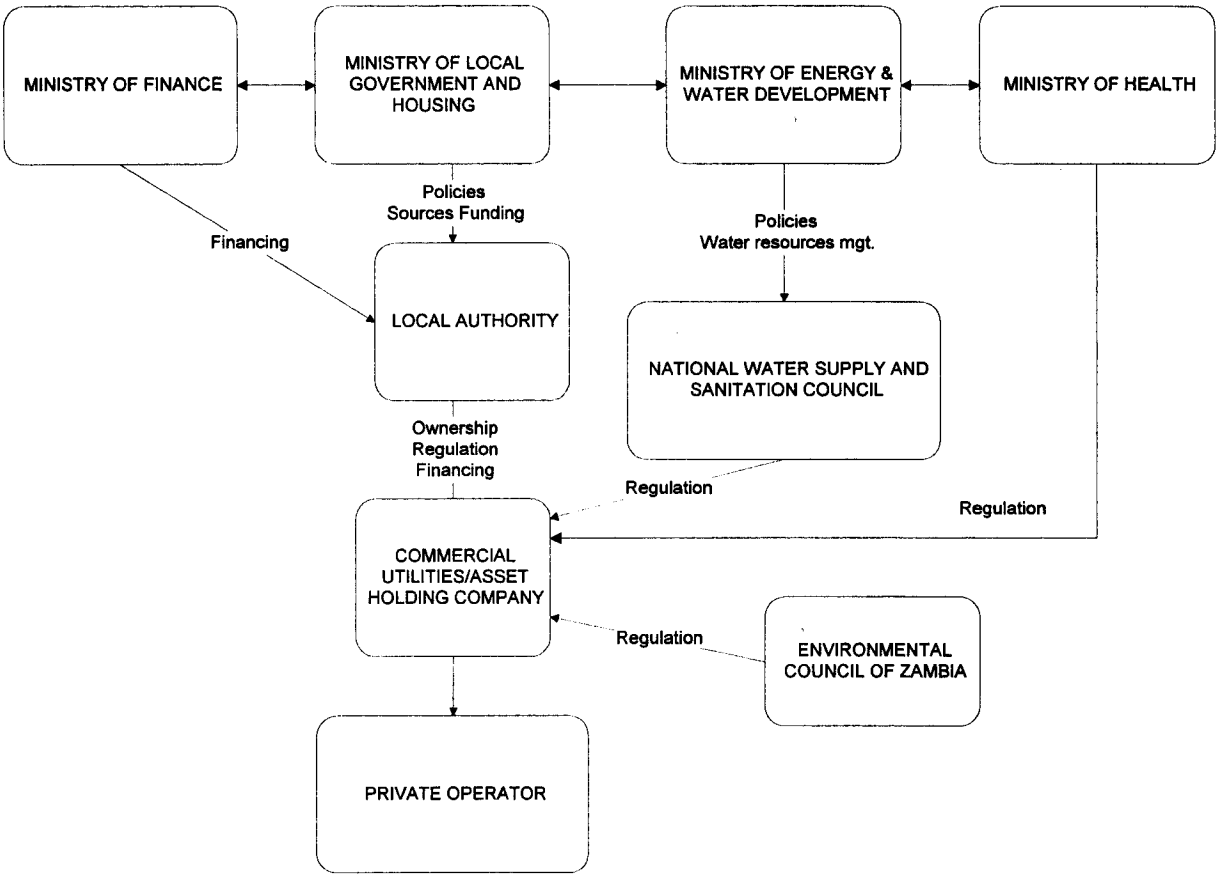


Table 4.5 below gives a summary of the responsibilities and general comments on each of the major key players in Zambia's water supply and sanitation sector.

Table 4.5: Responsibilities and Roles of key players in Zambia's Water Supply and Sanitation Sector

Organisation	Responsibilities and roles	Comments
Ministry of Finance and National Planning	• Facilitation of capital funding • Provision of grants	• Funding levels are very low due to poor macro-economic performance
Ministry of Local Government and Housing	• Resource mobilization • Policy formulation and	• Resources very scarce hence low availability

Organisation	Responsibilities and roles	Comments
	implementation • Local Government Administration	• Policy implementation inadequate largely due to insufficient resources
Ministry of Energy and Water Development	• Water resources management and development	• New legal and institutional framework currently under formulation
Ministry of Health	• Maintenance of acceptable sanitary and water quality standards for Human consumption	• Inadequate levels of enforcement due to insufficient resources
Local Authorities (LA's)	• Provision of water supply and sanitation schemes in municipalities. • Establishment of Commercial Utilities. • Enforcement of water quality standards	• Poor service delivery levels due to dysfunctional infrastructure, unqualified manpower, low cost recovery rates, political interference and non adherence to commercial principles. • Lack of capital needed for capitalization of the formed CU's • Inadequate levels of enforcement due to insufficient resources.
Commercial Utilities (CU)	• Provision of water supply and sanitation services to municipality populace.	• Poor service levels due to under-capitalisation, interference from the LA's, unqualified and incompetent staff, low cost recovery rates. • Poor network and operational equipment.
National Water Supply and Sanitation Council	• Regulation of the water supply and sanitation sector in Zambia • Advise Government and LA's on all matters affecting water supply and sanitation • Licensing all the service providers and issuing of guidelines and standards	• Full impact of this institution yet to be realised nationwide as this approach is still new. • There is still need to collect more reliable 'performance data' from the service providers as this exercise is new to the sector.
Environmental Council of Zambia	• Monitoring of pollution to water bodies and toxicity levels of	• Limited capacity due to resource constraints and lack of presence

Organisation	Responsibilities and roles	Comments
	effluent discharge from sewage treatment plants.	at district level
Water Development Board	• Issues water abstraction rights	

A comparative analysis of Zambia's institutional framework with those of Uganda and Tanzania is dealt with in Chapter Five.

4.1.5 Regulatory framework

Rees (1998) defines regulation as, *"sets of commands issued by governments, which are designed to control behaviour with accompanying 'police forces' and penalties for failure to obey"*. The key elements of a regulatory regime in the water supply and sanitation sector applicable in any country are outlined in Table 4.6 below.

Table 4.6: Key elements of a Regulatory regime

Element	Description
General Framework of laws	• Constitutional rules • Policies • Laws (Labour, Taxation, Currency controls) • Institutional and administrative structures
Water Resource and Environmental laws	• Issuance of water rights, pollution control, resource conservation and other protection mechanisms
Specific water and sanitation sector regulation	• Legislation enabling PSP, • Powers and capacity of regulatory agencies • Water quality standards • Levels of Unaccounted for Water • Collection efficiency • Staff per 1000 connections • Water coverage ratios • Sanitation coverage ratios • Metering efficiency • Billing efficiency

Element	Description
Contracts and or licenses	• These are mechanisms under which service provision is administered

Source: Rees Judith (1998), 'Regulation and Private Participation in the Water and Sanitation Sector"

Zambia has addressed all the four major elements required for a sound regulatory regime. However since this approach is relatively new, there are still many teething problems that are inherent which should gradually reduce as more experience is gained and higher levels of management capacity are developed amongst those entrusted with effecting and implementation of the various regulatory functions. Zambia has made major strides in this area as there is now a much more well-defined and coherent regulatory framework in place. Though still relatively new, it still acts as a good indicator to potential participants in the sector both from within and outside the country in that there is in place a strong mechanism for fair and balanced regulation, which will help reduce the risk related concerns that they may harbour. However, much still needs to be done by way of information dissemination to the general public on the functions of the various regulatory agencies. This is mainly because organisations such as NWASCO are relatively new in the sector and many consumers are not fully aware of the many avenues this arrangement creates for them to seek redress through lodging of complaints in situations where there is poor service delivery, unreasonable tariffs etc.

The reforms in Zambia's water sector that were effected in the early 1990's brought about a complete reinvigoration in the overall approach to regulation activities in the sector. The enactment of the WSS Act No 28 of 1997 was a key milestone in this process which culminated in the establishment of the National Water and Sanitation Council (NWASCO) an organization now chiefly responsible for regulatory activities in the sector. The proviso in this act that allows local authorities to establish commercial utilities and also to enter into partnerships with the private sector necessitates this new approach.

The participation of the private sector in the service delivery arena can act as a catalyst for access to the required capital, in light of inability by government to continue availing

subsidies for services provision, a situation which has been found to be highly unsustainable. However the extent to which the private sector will participate in a particular market hinges on how conducive the regulatory, legislative and institutional framework is and how much independence and discretion is entrusted to the regulatory bodies during the execution of their roles, which is what is being developed in Zambia.

4.2 CASE STUDIES

4.2.1 UGANDA, NATIONAL WATER AND SEWERAGE CORPORATION

Uganda is located in East Africa and has a land area of about 236,000 km^2. It has a population of approximately 24.7 million people rising at an annual growth rate of about 2.94%.

The National Water and Sewerage Corporation (NWSC)

The NWSC is a semi-autonomous utility owned by the Government of Uganda (GOU). It was created by presidential decree in 1972 (decree No. 34). The mandate of the NWSC is outlined in the NWSC Statute of 1995, Section 5 (1), which states that, *"the objectives of the corporation shall be to operate and provide water and sewerage services in areas entrusted to it under the Water Statute 1995"*. The NWSC operations were initially in the three towns of Kampala, Jinja and Entebee. It has since 1988 had twelve more towns added to its portfolio bringing the total to fifteen towns.

Private Sector Participation Contract – City of Kampala, Uganda

(a) Contract general information

Name of Private Operator: ONDEO SERVICES of France

Type of contract:	Management Contract (Enhanced and Performance Based)
Duration:	2 years
Assets:	Public ownership retained under the responsibility of NWSC, which is the Asset Holding Company on behalf of GOU
Staff in service:	(1) The private operator shall be the employer of the Operations Staff in the Service Area. These staff shall be initially drawn from the existing employees of the NWSC and will be

granted unpaid leave for the duration of their employment with the private operator. The selected staff will retain the right to refuse to be transferred and will in such circumstances continue to be employees of the NWSC.

(2) The private operator shall pay the wages, salaries, benefits and social taxes of the Operations staff in accordance with the prevailing wage rates in the local market subject to the provision that staff on transfer from the NWSC shall be remunerated at rates no less than they would have received had they remained in employment with NWSC.

(3) The private operator shall return to the NWSC any staff it deems need to undergo disciplinary action, dismissal and or lay offs.

(b) The Negotiation process

ONDEO Services was selected via a "competitive bidding" process. Their proposal was prepared after a due diligence study that they undertook prior to the formal bidding process. Due to the various technical, commercial and financial complexities found in public-private partnership contracts, it was inevitable that specialist advice be sought from various professional organisations and consultants in the following areas;

- Transaction matters
- Financial matters
- Audit matters
- Legal matters

(c) Allocation of responsibilities:

Main responsibilities of NWSC are;

- Responsible for the abstraction of raw water, treatment and transportation to the main service reservoirs. The water delivered should be of adequate volume and quality in order to enable the private operator meet the set performance standards.

- Responsible for the treatment of sewage (the treatment of sewage is to be carried out in a manner that does not adversely affect the operations of the private operator).
- Responsible for establishment of tariffs and effecting of changes to the same during the duration of the contract.
- Management of Head Office staff.
- Disbursement of fees payable to the private operator.
- To monitor and partially regulate the performance of the private operator.

Main responsibilities of ONDEO SERVICES (PO) are;

- Carry out the distribution and supply of treated water from the main service reservoirs.
- Carry out the collection of sewage and the onward transportation of the same to the treatment plant, which is operated by the NWSC.
- Maintain the physical infrastructure and facilities to an improved standard of maintenance and develop a comprehensive maintenance programme for the same.
- Carry out the repair and rehabilitation of the facilities with the Operational Investment Fund (OIF).
- As may be required participate in the implementation of Capital Investment Programmes instituted by the NWSC.
- Except as provided otherwise in the contract, to perform the same level of operations and maintenance as were performed by NWSC in the base year and satisfy as a minimum the performance standards that are contained in the Management Services Contract.
- To prepare and submit a detailed and comprehensive plan and budget for the use of funds identified in the OIF, to the NWSC for approval prior to implementation.
- To develop a programme for the identification of illegal connections to the water supply transmission and distribution system.
- To develop a programme for the identification of illegal connections to the sewer collection and transportation system and convert these into legally connected customers.

- Carry out all billings, collections and customer service functions pertaining to new and existing customers in the Service Area.
- To submit to the NWSC a comprehensive staff training and development programme for operations staff in service and oversee its implementation.

4.2.1.1 Policy Framework

Uganda's Water Policy is determined by the Water Policy Committee (WPC), which consists of various experts drawn from GOU, NWSC and other key stakeholders. The WPC exists through Water Statute 1995, Statutes Supplement No. 7, Statute No. 9. Section 10 states the functions of the WPC some of which are;

- To co-ordinate the preparation, implementation and amendment of the Water Action Plan and recommend the same to the Minister.
- May advise the Minister on issues of policy relevant to investigations, use, control, protection, management or administration of water.

The National Water Policy (1997) set the framework for developments in the urban water supply and sanitation sector. It acknowledges the fact that one of the main problems currently facing the population is low accessibility to water and sanitation services.

4.2.1.2 Legislative Framework

The NWSC was set up as a Government of Uganda (GOU) parastatal under decree No. 34 of 1972, during the military regime of President Idi Amin. The legal framework of this decree was strengthened by the NWSC Statute, Statute No 7 of 1995.

The principal functions of the NWSC under the Statute are;

- To manage water resources in ways which are most beneficial to the people of Uganda
- To render water supply services for domestic, stock, horticultural, industrial, commercial, recreational, environmental and other beneficial uses.
- To provide sewerage services, in any area in which it may be appointed to do so under this Statute or the Water Statute 1995.

- To develop the Water and Sewerage systems in urban centers and large National Institutions throughout the Country.

There are specific pieces of legislation that refer to the entering into of PSP arrangements by the NWSC. These are;

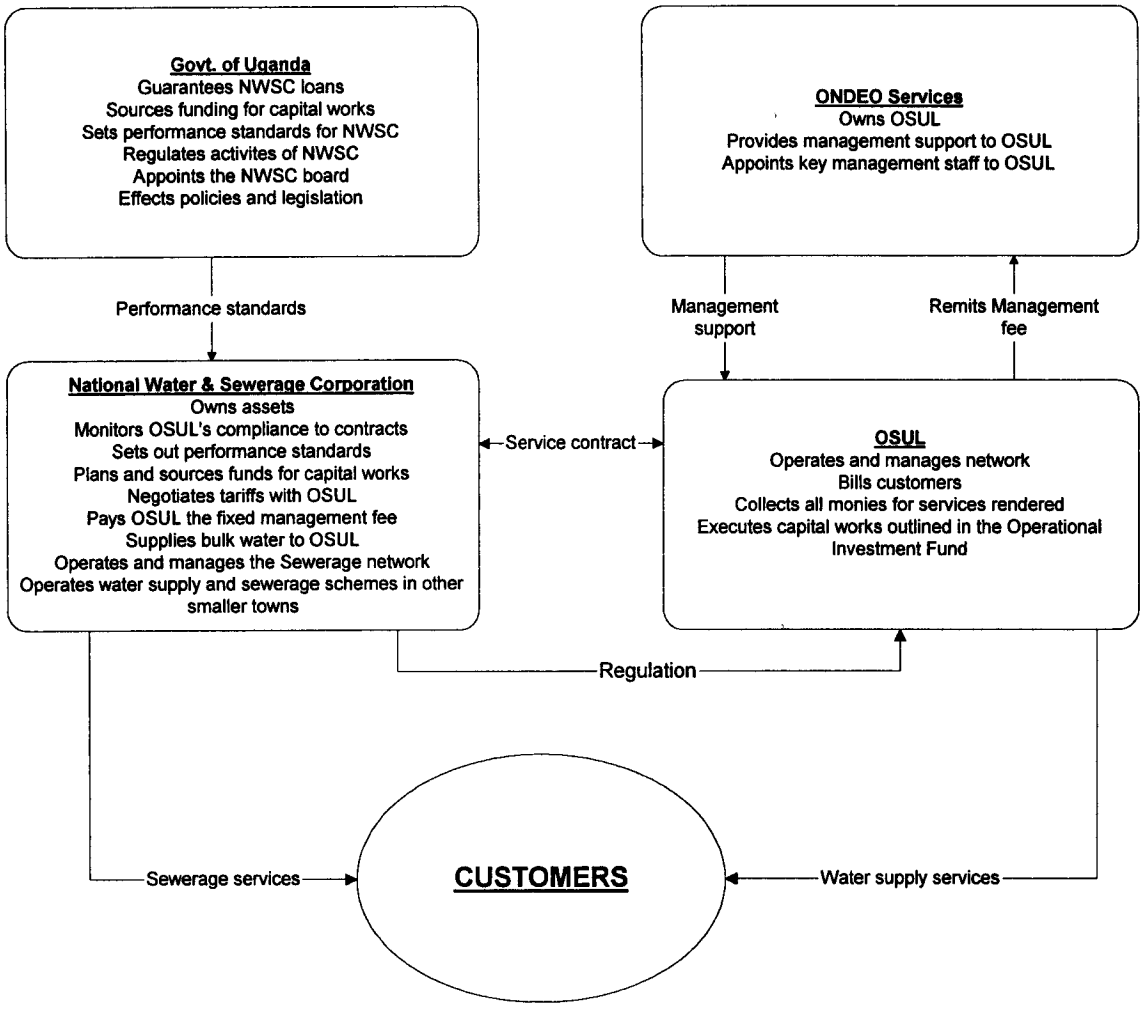
(1) The NWSC Statute, Statutes Supplement No. 7 of 1995, Statute No. 8 section Nos. 6 sub-section 2e which states that, *"the Corporation may participate in the formation of a company, trust, partnership or other body" and section 2h which states that, "the Corporation may enter into partnership or any arrangement for sharing a profit, union of interest, cooperation, joint venture, reciprocal concession or otherwise, with any person or body carrying on or engaged in, or about to engage in, any business or transaction, whether within or outside Uganda, which business or transaction is capable of being conducted so as to directly or indirectly benefit the Corporation".*

(2) The NWSC Statute, Statutes Supplement No. 7 of 1995, Statute No. 8 section No. 38 subsection 3 which states that, *"the Minister may require the corporation to enter into a performance contract under section 50 of the Water Statute 1995 in relation to any area for which it is appointed or deemed to be appointed under this section".*

4.2.1.3 Institutional Framework

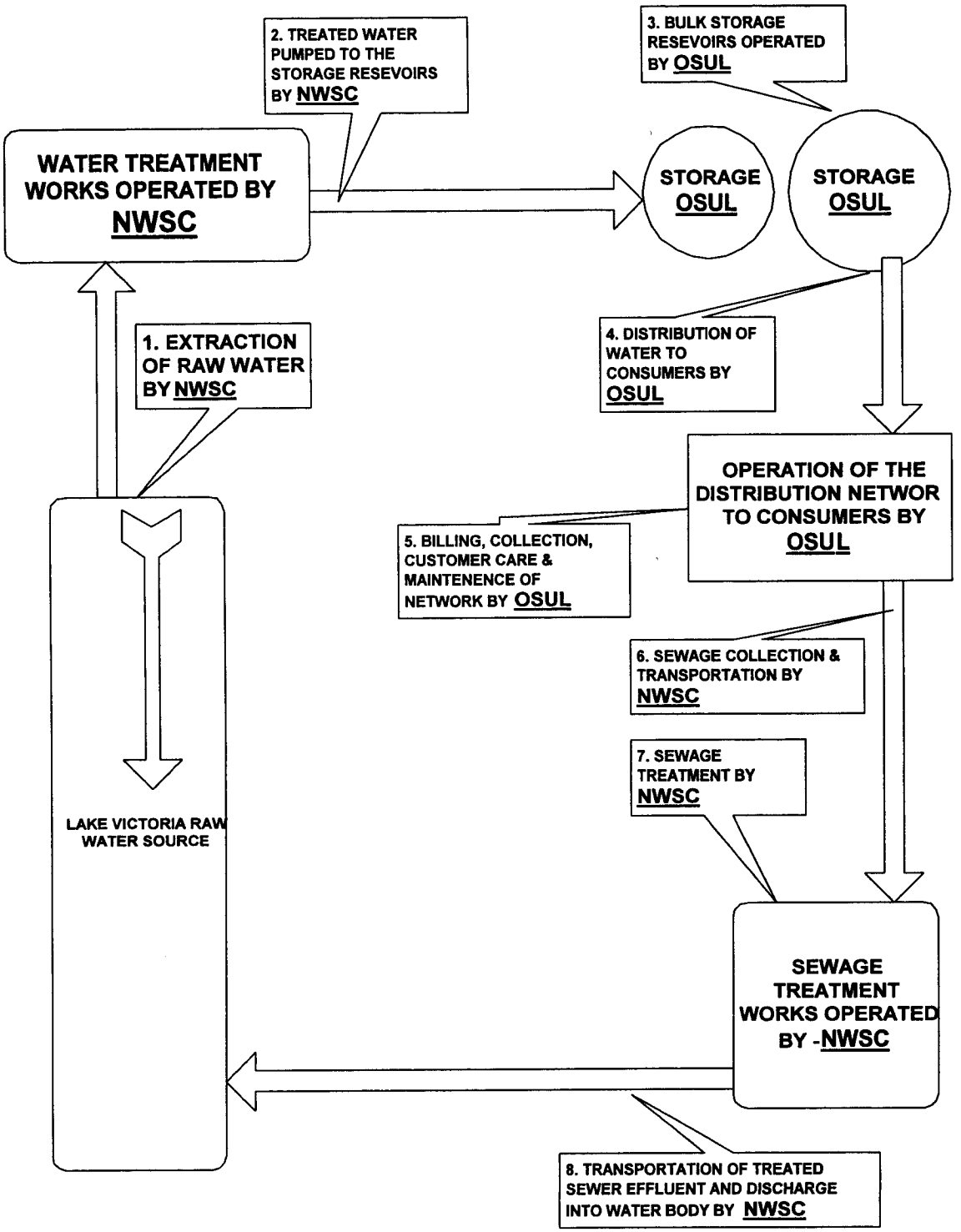
The NWSC is administered by a Management Team led by a Managing Director who is responsible to a Board of Directors appointed by the Minister responsible for Water Affairs. The GOU in this way holds indirect control on the affairs of the Corporation. Links also exist with the Directorate of Water Development (DWD) in the Ministry responsible for Water Affairs, as its Director is a member of the Board. Fig 4.5 illustrates the institutional arrangement for the PSP contract for the City of Kampala, Uganda.

Figure 4.5: Institutional arrangement for the PSP Contract in the City of Kampala, Uganda



The schematic layout of the distribution network and allocation of responsibilities amongst the key players is shown in Fig 4.6.

Fig 4.6: Schematic layout and allocation of responsibilities amongst the key players in water supply and sanitation provision in Kampala, Uganda



4.2.1.4 Regulatory Framework

The Regulation of water and sanitation services is currently done by the following Government depts. and agencies;

- Directorate of Water Development
- National Environment Management Authority
- National Bureau of Standards

Table 4.7: Uganda's regulatory agencies in the Water Supply and Sanitation Sector and their key functions

Agency	Regulatory responsibility
Directorate of Water Development	• Adherence to performance standards outlined i legislation
National Environment Management Authority	• Monitoring of toxicity levels in sewer effluent • Monitoring of pollution of water bodies
National Bureau of Standards	• Setting standards for water quality

There is also "self internal" Regulation through enforcement of the performance standards outlined in the PSP contracts between NWSC and the private operator.

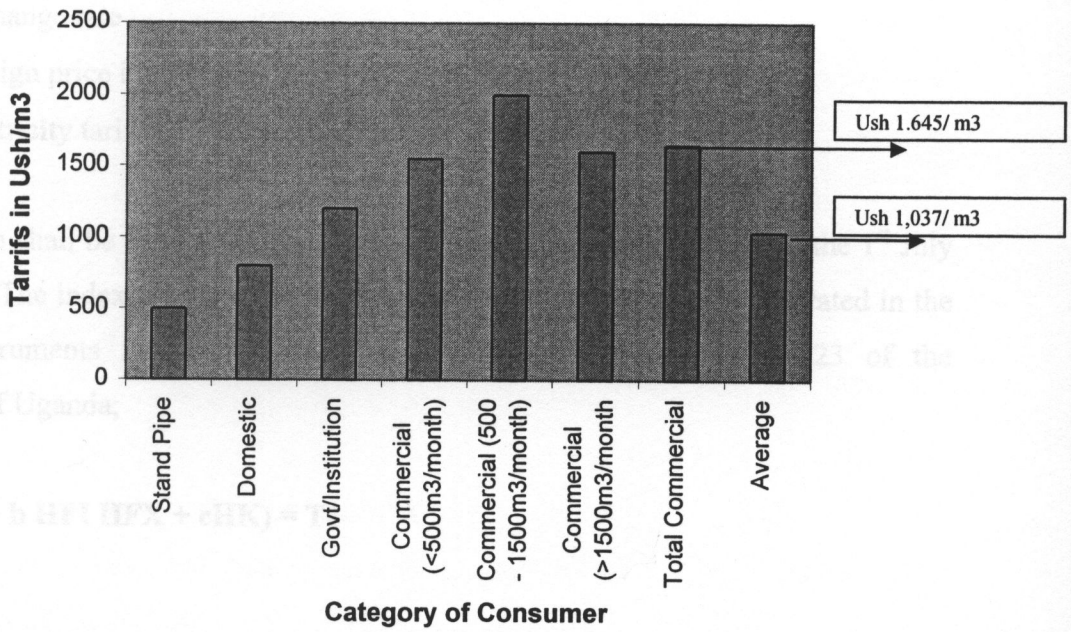
4.2.1.5 Tariffs

(a) Tariff structure

According to the NWSC Statute of 1995, Statutes No. 7 section 20, it is stated that, *"the Board shall from time to time prepare a three-year corporate plan, which will be submitted to the Minister responsible for Water and Natural Resources"*. The plan in its "Financial section" shall outline details of the significant tariffs, rates and charges, expected to be altered by the Corporation and the basis on which they are to be increased. These new tariffs can only be effected after prior approval has been obtained from the Minister.

The drive towards usage of more realistic tariffs, gained momentum from 1987, when the GOU initiated a drive to liberalise the economy and transform all state owned companies into self sustaining ventures. Onek and Kayaga (1997), state that, *"although a tariff structure had been in place; NWSC did not until 1987, formulate effective measures to recover the water rates, nor was the mechanism for price changing effective. NWSC's operations relied on government subvention, which in most cases was inadequate"*. Since government could not release enough funds for operations, maintenance and capital development the installations underwent a severe level of deterioration. Fig 4.7 illustrates the tariff structure at NWSC as of March 2003.

Fig 4.7: Tariff structure of the NWSC as at March 2003



Source: Draft Aide Memoire by the Water and Sanitation Component Joint Technical Review and Appraisal Mission March, 2003

- The Unit Operation and Maintenance cost is approx. **Ush 1037 (US$ 0.52) per m^3 (Ta)**
- The Unit Operation and Maintenance + Depreciation cost is approx. **Ush 1200 (US$ 0.60) per m^3 (Tb)**

- The Unit Operation and Maintenance + Depreciation + Current debt cost is approx. **Ush 1645 (US$ 0.83) per m^3 (Tc)**

The tariff required to enable debt servicing is about Ush 1645 per m3. This means that the tariff increase required to cater for this is;

$$\textit{Tariff increase to service debt} = [(Tc - Ta)/ Ta] * 100\%$$

It is clear that in the current operational framework the domestic consumers are subsidised by the commercial organisations and large institutions as their tariff band does not cover operational, maintenance and depreciation (replacement) costs.

(b) Tariff indexation

The GOU released Statutory Instrument (SI) No. 23 contained in the Statutory Instruments Supplement No.14 of 2002. These regulations referred to the annual adjustments of the tariffs due to the following;

- Domestic price index
- Exchange rate
- Foreign price index and
- Electricity tariffs

The indexation shall be carried out on a financial year basis, commencing on the 1st July of each year. The indexation shall be based upon the following formula as stated in the Statutory Instruments Supplement No 14, of Statutory Instrument No 23 of the Government of Uganda;

To + (a Hl + b HFI HFX + cHK) = T1

Whereby;

To *Tariff level at end of year zero*

a *Proportion of tariff associated with local salaries and locally sourced goods based on the audited financial accounts of the previous year*

H *Change*

I *Domestic retail price index as published by the Uganda National Bureau of Statistics and based on the underlying inflation rate*

b *The proportion of the tariff associated with foreign costs, that is, foreign inputs in the production process based on the audited financial accounts of the previous year*

FI *Foreign retail price index based on the United States Bureau of Labour Statistics*

FX *US Dollar to Uganda Shilling exchange rates based on the Uganda mid exchange rates as at the 30th June of each financial year*

c *Proportion of tariff associated with electrical power based on percentage of electricity cost to total cost as a proxy based on the audited financial accounts of the previous year*

K *Price of electrical power per unit*

T1 *Indexed tariff at the beginning of year one*

- The first application of this indexation formula was in April 2002 (the Indexation value for the year was 6%).
- A further 7% discount was given to all Commercial water based consumption in excess of 1500m^3 per month.

(c) Tariff Rates

A cross subsidy is in place, as the poor (low income groups), are currently charged at a tariff which is much lower than the minimum amount required to cover the basic unit Operational and Maintenance (O & M) costs. The costs that arise from depreciation and

servicing of debts are recouped from the higher profile consumers. These are drawn from the commercial sector and the applicable tariff rate varies depending on the consumption levels. Table 4.8 below outlines the various categories of customers, the tariff rate and the level of subsidy.

Table 4.8: Tariff rates and subsidy status

CATEGORY	Tariff in Ush per m3	Comment	Subsidy status
Stand pipe (poor)	Approx 500	Less than O&M cost	Fully subsidised
Domestic	Approx 800	Less than O&M cost	Fully subsidised
Govt./Institution	Approx 1200	Covers O&M cost excluding depreciation	Partially subsidized
Commercial (<500m^3/month)	Approx 1550	Covers O&M cost + depreciation excluding debt cost	Very minimal subsidy
Commercial (500-1500m^3/month)	Approx 2000	Covers O&M cost + depreciation + debt cost	No subsidy
Commercial (>1500m^3/month)	Approx 1600	Almost covers O&M cost + depreciation + debt cost	Very minimal subsidy
Total Commercial	1645	"Break even" tariff, full cost recovery is achieved	
Average	1037	Average tariff when all the tariff bands are aggregated	

Source: Own assembly using data from the Draft Aide Memoire by the Water and Sanitation Component Joint Technical Review and Appraisal Mission March, 2003

Exchange rate in mid 2003: 1US$ equivalent to 2000 Uganda Shillings (Ush)

4.2.1.6 Service provision to the poor

This is given special attention due to the various complexities associated with its provision. A project known as the "Water Supply in informal Settlements" will be incepted soon after organisational and technical modalities are completed. The main expected outputs of this project are to;

- Increase penetration from main distribution lines
- Provide piped supply into private homes and install pre-paid meters on a "Pilot Project" basis
- Reduce water costs charged by vendors and middlemen (sometimes up to 10 times higher than the social tariff).

The planning for this project is being undertaken jointly by the NWSC, Kampala City Council (KCC) and the Donor agencies. Funding for this project has been obtained from;

(a) KFW of Germany (2.5 Million Euros)

(b) AFD of France (3.0 Million Euros)

(c) GOU (US $400,000)

There are several types of measures used to avail services and increase access to the "low-income" groups. These are;

- Kiosks
- Public Stand Posts
- Yard Taps

(i) Kiosks

These are structures that are built at certain strategic locations within the peri-urban areas where members of the community procure their daily water needs. A private water vendor or a "local community association" operates the Kiosk.

Experiences encountered with Kiosks:

- Cost of water from the vendors ranges between 3 to 5 times on average above the "social tariff" set by NWSC for peri-urban areas.
- Vendors have a propensity to misuse funds collected leading to eventual disconnection of supply. This poses problems and great inconvenience to consumers, as they pay cash for the water they consume, but may still be deprived of supply due to poor management practices on the part of the vendor. This can lead to frustration amongst the consumers and a lack of confidence in the entire process.
- Distances to the water points have been found to be too long in certain instances coupled with significantly high amounts of time spent on queues. Consumers resort to hiring "mobile vendors" who charge up to 10 times as much. There is also the risk of the vendors, in an effort to maximise on returns, supplying water from wells and other sources whose quality is suspect due to contamination from

pit latrines, uncontrolled solid waste disposal sites, surface drainage channels etc. This situation increases the likelihood of disease outbreak occurrence.

- High construction cost of the infra-structure.
- Difficulty at times to obtain land on which to erect the structure.

(ii) Public Stand Posts

These are stand-pipes erected at strategic locations within the peri-urban areas where residents can procure their daily water needs from a private vendor or local community association.

Experiences encountered with Public Stand Posts:

- Cheaper to erect than Kiosks.
- Has to be constructed within a Road reserve or any publicly owned piece of land. This may affect accessibility for those residing far away from the Stand Post especially when it is difficult to find suitable pieces of land on which to build it.
- The private vendor is required to pay 2 months down-payment as security for likely default
- Distances found to be too long in certain instances. Consumers resort to hiring mobile vendors who charge up to 10 times as much. There is also the risk of the vendors supplying water from wells and other unhygienic sources to the unsuspecting consumers, which increases the likelihood of disease outbreak.

(iii) Yard Taps

These are stand-pipes installed within an individual's plot whereby the plot owner is financially liable for all the water used. The connected consumer can sell water to those residing within close proximity to his/her premises. The main incentive here is that the seller may actually benefit from cheaper water supply as he/she will recoup his/her consumption costs from the surpluses realised from the sales. The plot owner is requested to enter into a contract with the NWSC.

Experiences encountered with Yard Taps:

- It has been found easier to recover monies owed from plot owners in that there is some security attached to the contract. The property of the defaulter can be used as collateral in lieu of outstanding debt settlement.
- Accessibility is increased as water is taken directly to the users since they spend less time acquiring their daily water needs which enables them to spend time on gainful economic activities which contributes to poverty alleviation.
- Bills are not allowed to accumulate for more than 2 months.
- Water is cheaper since the total number of users per tap is lower (i.e. the plot owner cannot charge excessive rates since there are several other consumers within his/her immediate vicinity who are connected to the network giving rise to competition).

Technology Choice:

The Technology in use in the accessibility improvement programme has to be;

- Easy to install
- Easy to route around the unplanned settlements
- Competitively priced
- Low labour cost to install
- Long lasting and sustainable

The following are some of the new technological options in use or proposed for use.

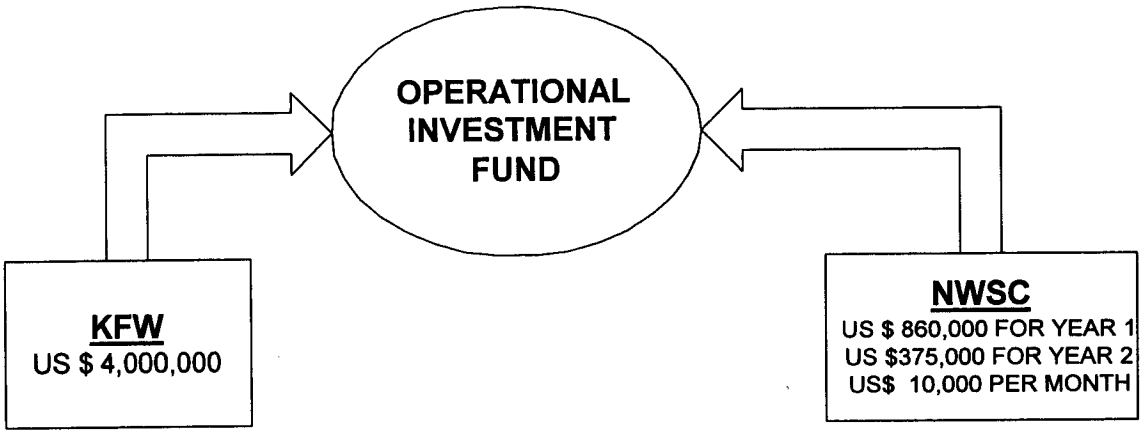
(1) The High Density Polyethelene Pipe (HDPE) is currently used for water supply in the informal settlements due to the ease with which you can "loop" it around the different structures. It is also very easy to install, requires less fittings and does not need highly skilled manpower to install as compared to the galvanised steel pipes.

(2) There is a Pilot programme to install pre-paid meters, which may be implemented based on the findings of this programme.

4.2.1.7 Capital Investment Strategies

The main vehicle through which Capital Investments are to be effected, is the Operational Investment Fund (OIF). The funding has been sourced from KFW of Germany and the NWSC as illustrated in Fig. 4.8.

Fig 4.8: Sources of Funding for the Operational Investment Fund



The allocation of funds is shown in Table 4.9 below;

Table 4.9: Allocation of the Operational Investment Fund

From NWSC monthly contribution of US 10,000	From the NWSC annual contribution	From the KFW contribution
Procurement of services (Electricity supply for pumping stations, small repairs etc.)	Procurement of services mainly for rehabilitation	Procurement of services
Purchase of goods (Small spare parts and consumables)	Purchase of goods	Purchase of goods

Source: Management Services Contract for the Kampala Water Supply and Sewerage Service Area

4.2.1.8 Performance Targets and incentives

The Performance Standards that have been set out in the Management Contract cover several elements of the entire service delivery process. They were arrived at based on "base-line" data, which was collected over a two years period that immediately preceded the inception of the Management Contract. Table 4.10 below shows the key performance standards that have to be achieved by the private operator.

Table 4.10: Performance Targets for the PSP Management Services Contract, Kampala City

Ref	Performance Criteria	Performance at end of base year	Performance by end of year 1	Performance by end of year 2	Performance by end of year 3
A	Average monthly volume of water delivered to the private operator in m3	2,811,913	2,930,000	3,035,000	3,085,000
B	Average monthly volume of water billed by the private operator in m3	1,561,985	1,765,000	1,952,500	2,077,500
C	Ave. Unaccounted for water (A-B)/A %	44%	40%	36%	33%
D	Ave. Monthly total billings (W & S)	1,611,421	1,820,900	2,014,300	2,143,200
E	Ave. Monthly non govt. billings (W & S)	1,236,913	1,434,900	1,628,300	1,757,200
F	Ave. Monthly govt. billings (W & S)	374,508	386,000	386,000	386,000
G	Ave. Monthly total collections	1,567,842	1,900,600	2,123,100	2,326,945
H	Ave. Monthly non-govt. collections • Collections from govt. bills • Collections from current debt	1,344,811	1,479,100	1,681,900 1,465,500 216,400	1,885,745 1,669,300 216,400
I	Ave. Monthly govt. collections • Collections from current bills • Collections from current debt	232,031	421,500 347,000 74,500	441,200 366,700 74,500	441,200 366,700 74,500
J	No. of active connections water supply	31,867	39,070	46,480	55,450
K	No. of inactive connections	10,464	8,760	6,920	4,240
L	Total no. of connections	42,331	47,830	53,760	59,960
M	Connection efficiency J/L %	75%	80%	84%	87%
N	No. of metered connections	38,068	43,470	50,000	57,000
O	No. of un-metered connections	4,263	4,360	3,760	2,960
P	Metering Efficiency N/L	90%	91%	93%	95%
Q	No of new connections per month	473	525	580	630
R	Ave. response to customer complaints	40hrs	37hrs	33hrs	30hrs

Ref	Performance Criteria	Performance at end of base year	Performance by end of year 1	Performance by end of year 2	Performance by end of year 3
S	Ave. response to water leakage/ bursts	16hrs	13hrs	12hrs	12hrs
T	Ave. response to sewer blockages	43hrs	36hrs	32hrs	24hrs

Source: Management Services Contract for the Kampala Water Supply and Sewerage Service Area

The incentive computations are payable to the private operator depending upon the extent to which the private operator exceeds the minimum performance standards under the following main categories;

- Un-accounted for Water (UFW)
- Non-Government collections
- Connection Efficiency

The method of calculation is based on pre-determined formulae.

4.2.1.9 Management of Political interests

Political interference was one of the reasons why NWSC entered into a PSP arrangement. There was a very large debt stock emanating from Government institutions, departments and private consumers with strong connections to the higher authorities. Interviewed officials at the NWSC stated that they underwent a barrage of threats resulting in extreme job insecurity when one attempted to enforce the NWSC's right to disconnect supply from defaulters for non payment. The general consensus was that Government payments for services received had improved during the tenure of the private operator. The "well connected" private consumers no longer enjoy any special privileges as the private operator is able to enforce indiscriminate disconnection for non-payment to defaulting customers.

4.2.1.10Public – Public Partnership Contract

In an effort to enhance performance and in so doing meet the targets set out in the GOU-NWSC performance contract, the Board and Management of the NWSC decided in 1998 to critically examine the overall performance of the Corporation. Muhairwe (2000)

quoting a World Bank report which stated that, *"Over the last 10 years, the GOU in partnership with the World Bank and other donors have made significant investments (over US $ 100 million) in the Urban Water and Sewerage sector. These investments have contributed immensely in rehabilitating the existing infrastructure under the NWSC management. Unfortunately, these investments have not been matched with the necessary efficient commercial and financial management capacity that can ensure the delivery of sustainable services in the medium to long term".*

The tasks and challenges that faced the new management were enormous. A new revolutionary outlook regarding performance enhancement of NWSC was launched. This entailed undertaking a detailed analysis of the existing situation in order to identify the major corporate performance gaps and map out where the NWSC ought to be. This process was carried out through usage of a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis. The results obtained are shown in Table 4.11;

Table 4.11: SWOT Analysis results for the NWSC

STRENGTHS	• A relatively sound water and sewerage infrastructure • Abundant raw water for abstraction • A competent and relatively well qualified senior management team • Good positioning of NWSC services to other utility services • A good and enabling water legislative framework • A relatively good organisational autonomy
WEAKNESSES	• Operational frame with a large No. of unviable towns • High arrears; at US $ 15million (equivalent to 14 months of debt age) • Expensive inefficient labour force 1800 staff equivalent to 36 staff per 1000 connections (This amounted to 64% of the total operating costs) • Low morale amongst staff • Low operating efficiency (e.g. UFW @ 60%) • No external customer survey system to ascertain customers needs and preferences, which contributed to poor customer orientation • Irrational and costly welfare schemes for staff (e.g. the medical scheme) • Poor organisational behaviour amongst staff e.g. late coming, corruption, poor hygiene and cleanliness in the corporation's premises like the pump houses, water treatment plants, offices etc. • A high running monthly financial debt averaging about US $174,000 due to poor billing and collection efficiency • Lack of performance incentives (reward systems) for area managers • Rampant water leakages and sewage spillage
OPPORTUNITIES	• Government's support for the water sector • A relatively good public image • Donor confidence

	• A relatively stable national economy
THREATS	• Low customer's ability to pay (especially in the small towns) • A Value Added Tax (VAT) law that placed the corporation on a collision course with the Uganda Revenue Authority (URA) • Large external debt servicing obligations on-lent to NWSC by GOU • Lack of in-country manufacturing of most of the operational hardware inputs

Source: Managing strategic change in organisations, a paper presented by Muhairwe W., Managing Director NWSC in Kampala Uganda (2000)

The findings of this analysis revealed the immense opportunity for enhanced performance. Strategies had to be developed to improve the Corporation's performance. One output of this process is the Public-Public Partnership, which is an arrangement whereby the NWSC HQ. enters into an "Area Performance Contract" with the area management teams. Another factor that necessitated this approach was the need to address the targets that GOU had set out in its Performance Contract entered into with the NWSC.

This arrangement was expected to yield the following outputs;

- Increased autonomy of Area and Support departments
- Enhanced commercial orientation
- Creation of result and output oriented management styles
- Increased accountability
- A clear separation of responsibilities
- Creation of incentives and disincentives, which would be the main drivers of performance.

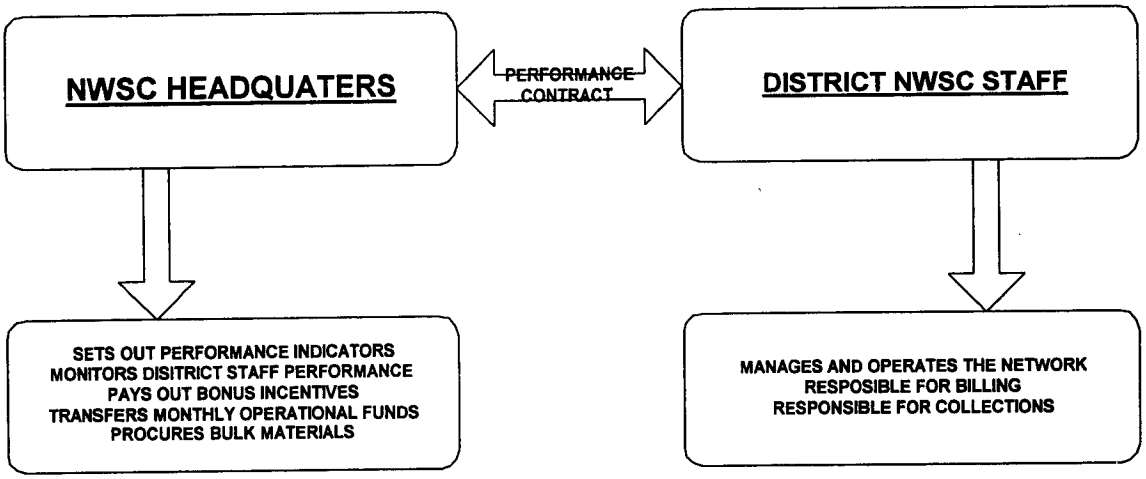
(a) Organisation

An Area Manager responsible for a designated area (e.g. Town), in collaboration with other staff members working within the Area, prepare a comprehensive business plan, showing clearly how the Area will achieve goals set out in the overall NWSC business plan. Once approved by the NWSC HQ., the Area Manager is given full authority of

the operations and maintenance functions in the Area. NWSC however, retains overall supervisory responsibility.

All revenues collected in the Area are deposited into a "cash account" controlled by NWSC, whilst NWSC on a monthly basis transfers into the Area's "operations account", the pre set-out monthly budgeted working capital (as per outlined in the contract) for usage in the day to day operations. These funds are sourced from their monthly collections. The responsibilities and roles between the headquarters and district units are shown in Fig 4.9.

Fig 4.9: Roles and Responsibilities in a "Area Performance Contract" for the NWSC



The main advantages and results of this approach have been;

(1) A "cross subsidy" is effected between the "good performers" and the "low performers".

(2) Development of a sense of competitiveness amongst the various Areas, which acts as a catalyst for high levels of performance.

(3) An ability by all the Areas to cover their Operational and Maintenance costs. Some are even able to cater for their Capital expenditure needs.

Procurement of major consumable items such as Chlorine, Lime, Aluminium Sulphate etc. is done centrally by NWSC for all the different Areas in order to derive direct benefits from bulk discounts.

(b) Performance Targets

The targets as set out in the "Area Performance Contracts (APC)" dwell on several distinct components of the overall service enhancement process. Some of these are;

- Improved billing of water and sewerage services to increase billing efficiency.
- Improvement of revenue collection to increase collection efficiency.
- Improvement of arrears and "bad debt" recovery to reduce on equivalent-debt-age of all unpaid water and sewerage services bills.
- Improvement of water distribution, operation and maintenance to reduce on water losses through bursts, leaks and wastage.
- Expansion on the customer base to increase on water supply coverage.
- Establishment of customer related systems to improve on customer awareness and the overall customer service delivery.

(c) Performance Evaluation

Quarterly consultative meetings are held between the NWSC HQ. and the Area Management Team. The meetings are to review all aspects of the contract and its progress. Adjustments may be made to the targets and milestones stipulated in the APC, should there be need to do so.

(d) Bonus Incentive scheme

The Area Manager together with his staff are paid incentives when they achieve at least 95% of the various targets outlined in the APC. These payments range from 10% of the annual basic salary to 25% of the profit, which is defined as the positive difference between "the targeted revenue collection" and the "actual revenue collection". This excludes collections from the Police, Defence, Prisons and Presidents office. There is also a dis-incentive scheme where the Area Manager can be withdrawn when less than 85% of the targets are achieved.

4.2.2 TANZANIA, DAR ES SALAAM WATER AND SEWERAGE CORPORATION

Tanzania is located in East Africa and has a land area of about 945,000 km^2. It has a population of approximately 34.5 million people rising at an annual growth rate of about 2.9%[1].

The Dar Es Salaam Water and Sewerage Authority (DAWASA)

DAWASA, a publicly owned company, was established in April 1997 through an Act of Parliament No. 7 of 1981 as amended by Act No 8 of 1997. This was done by merging the now defunct National Urban Water Authority (NUWA), with the also defunct Dar Es Salaam Sewerage and Sanitation Department (DSSD) of the City Commission. Further amendments were made to the Act in 1999 to facilitate for adoption of a PSP arrangement.

The City of Dar Es Salaam, which is the main business and commercial center in Tanzania, has a population of approximately 2,5 million increasing at an annual growth rate of about 4.2%[1]. This population growth is attributed to normal population growth and rapid rural to urban migration trends as people seek new economic opportunities in the urban areas and.

The quality of service rendered by DAWASA however, has declined over the years due to several reasons some of which are;

- Severe state of disrepair in the network infrastructure due to lack (or an absence) of investment in the infrastructure
- Complete neglect and non adherence to standard maintenance and operation procedures for long periods during operations

[1] Source: The Tanzania population and housing results, 2002

- A rapidly growing population, which implies that the WSS infrastructure should be increased at a correspondingly proportional rate.

In the year 2001, the DAWASA 2001 Act was passed, thereby superceding the DAWASA 1981 Act, which was repealed. The 2001 DAWASA act, part II, section 7 states that, *"DAWASA may appoint an operator to perform the functions and exercise the powers which are vested on it by this act on such terms and for a period as may be specified in a concession, contract or agreement entered into between itself and the operator"*. This and other sections of the act, clearly pave the way for pursuance of suitable and appropriate PSP arrangements that can be entered into, to revitalize the sector.

Private Sector Participation Contract – City of Dar Es Salaam, Tanzania

(a) Contract general information

Name of Private Operator:	**City Water Services (A joint venture between JB GAUFF of Germany and BIWATER plc of The United Kingdom)**
Type of contract:	Lease
Duration:	10 years
Assets:	Public ownership to be retained under responsibility of "DAWASA- PGA" (Dar Es Salaam Water and Sewerage Authority Public Granting Authority) which shall be the Asset Holding Company (AHC) on behalf of the Government of Tanzania (GOT).
Staff in service:	Some of the staff are to be retained by DAWASA whilst others are to be transferred to the private operator. According to the DAWASA Act 2001 staff may be transferred from DAWASA to the private operator on terms *"which are not less favourable than those applicable to them prior to such transfer"*. It also states that,

"the arrangement made between DAWASA and the private operator shall not include a provision preventing DAWASA or the private operator, as the case may be, to retrench any employee of DAWASA".

(b) The Negotiation process

The process to enter into a PSP arrangement for DAWASA began in 1997 after GOT realized that in order for there to be an improvement in the WSS services in the city, there had to be an immediate introduction of new capital for investment. However the GOT clearly did not have the needed capital and potential donors and multilateral lending institutions insisted that a private operator be procured first before availing any funding. The most feasible route that GOT had to take, was to begin the process of procuring a private operator as it was believed that with the introduction of a private operator, there would not only be an enhancement in the overall operating efficiency but also the advent of new capital for investment. Terms of reference, which solicited for a PSP arrangement, were issued signifying the beginning of the procurement phase.

(c) Allocation of responsibilities:

Main responsibilities of DAWASA-PGA are;

- Leasing of assets to the private operator (City Water Services-CWS)
- Implementation of the Capital Investment Program
- Development of new water sources for onward handing over to the private operator
- To monitor the performance of the private operator

Main responsibilities of the Private Operator are;

- To operate and maintain the greater Dar Es Salaam water supply and sewerage system
- To collect first time connection charges and revenue from consumers based on the approved tariffs

- To implement delegated capital works

Table 4.12: Chronological sequence of the events that occurred up to the adoption of the PSP arrangement

YEAR	ACTIVITY	BY WHOM	OUTPUTS
08/1997	Request for funding for the Dar Es Salaam Water Supply and Sanitation Project (DWSSP)	DAWASA	ADB deferred making a decision to await outcome of GOT's negotiations with private operators
1997	Issuance of ToR for PSP	GOT	Four international water operators responded*
1997	Evaluation	GOT	No decision was reached, request made for supplementary information
06/1998 onwards	Recruitment of international transaction consultants and formation of the DTT	PPRSC	Preparation of the Supplementary Information Paper (SIP)
06/1998	Holding of several stakeholder seminars	PPRSC	To enable them understand and appreciate the importance of the exercise
1998/9	Dialogue with three pre-qualified bidders	PPRSC	Preparation for re-tendering process
08/1999 to 01/2000	Commencement of Tender process for a 10 year lease	PPRSC	Two Bids received, with one operator withdrawing from the bid process
01/2000 to 05/2000	Evaluation of bids	PPRSC	Rejection of bids on grounds that they were "non responsive"
06/2000	Decision to carry out full re-bid open to all the international water operators	GOT	Preparation for re-bid
09/2000	Pre-qualification for the re-bidding process started. Adverts were sent out internationally	GOT and PPRSC	Eight applications to pre-qualify were received but only three were accepted after the evaluation of the submissions
2001	Enactment of legislation	GOT	DAWASA ACT 2001 and EWURA ACT 2001
02/2002 to 07/2002	Tender documents issued to selected bidders	GOT and PPRSC	Bids received and operator selected after submission date, namely Biwater plc and JBG Gauff, operating as City Water Services (CWS)
19/02/2003	Signing of lease agreement	DAWASA and CWS	Preparation by DAWASA and CWS for handover of operations
07/2003	Commencement of operations by CWS	DAWASA and CWS	PSP arrangement (lease type) to commence

Source: DAWASA projects: www.dawasa.org

PPRSC - Presidential Parastatal Sector Reform Commission ; GOT - Government of Tanzania

EWURA – Energy and Water Utilities Regulatory Authority ; DTT - Divestiture Technical Committee

4.2.2.1 Policy Framework

In 1991, the Government of Tanzania (GOT), launched the National Water Policy (NWP), which dwelt on various reforms and strategies to be adopted and implemented in the entire water sector. However after a decade of its implementation it was found to contain certain deficiencies. According to the recently launched NWP of 2002, it is stated that, *"the main shortfall in the NWP of 1991 can be identified in the implementation strategies, which emphasized that the central government is a sole investor, implementer and manager of the projects, both in rural and urban areas".*

As far as Urban Water Supply and Sewerage (UWSS) is concerned, the NWP of 2002 redefines government's role from that of service provider, to that of co-ordination, policy and guidelines formulation, and regulation. Some of the specific objectives of the new policy in the context of developing and managing UWSS services are;

- To guide the development and management of efficient, effective and sustainable water supply and waste disposal systems in urban centers.
- To create an enabling environment and appropriate incentives for the delivery of reliable, sustainable and affordable UWSS services.
- To develop an effective institutional framework and ensuring that the water supply and sewerage entities are financially autonomous.
- To enhance an efficient and effective system of income generation from sale of water and wastewater removal.
- To enhance water demand management and waste water disposal.

A number of pre-set goals have been derived from the above objectives. Some of these include the following;

- To have an improved infrastructure for sustainable and efficient WSS services.
- To have a tariff setting mechanism which will ensure that water users pay for full cost recovery.
- To attract private sector investment in the UWSS sub-sector.
- To have efficient UWSS services through PSP

- To prevent wasteful water use and control water leakages.
- To improve WSS services in low income and peri-urban areas.

4.2.2.2 Legislative Framework

In 1997 legal and institutional reforms were carried out to transform UWSS departments into autonomous Authorities under Boards of Directors. These reforms made the Boards more independent in running the affairs of the Authorities. As a result of these reforms there was a need for the legislation to be reviewed with a view of addressing the inadequacies that were now inherent based on the new scenario. Other details of these changes and the subsequent reviews to the legislation are outlined in the 'Introduction' and sections 4.2.2.4 of this report.

4.2.2.3 Institutional Framework

The overall responsibility for water management in Tanzania is vested in the Ministry of Water and Livestock Development (MOWLD), which has several directorates dealing with specific aspects pertaining to water resources management. These are;

- The Water Resources Assessment and Exploration Division
- The Urban Water Supply and Sewerage Division
- The Rural Water Supply Division

The DAWASA board is responsible to the Minister of Water and Livestock Development but confers with the division of Urban Water Supply and Sewerage for technical and operational matters.

4.2.2.4 Regulatory Framework

The responsibility of Regulation of the UWSS sector is under an independent regulator called the Energy and Water Utilities Regulatory Authority (EWURA). It was established after passing the EWURA act of 2001, which enshrines the four regulatory principles of independence, transparency, professionalism and accountability.

EWURA has the prime duty to strive to enhance the welfare of Tanzania society by;

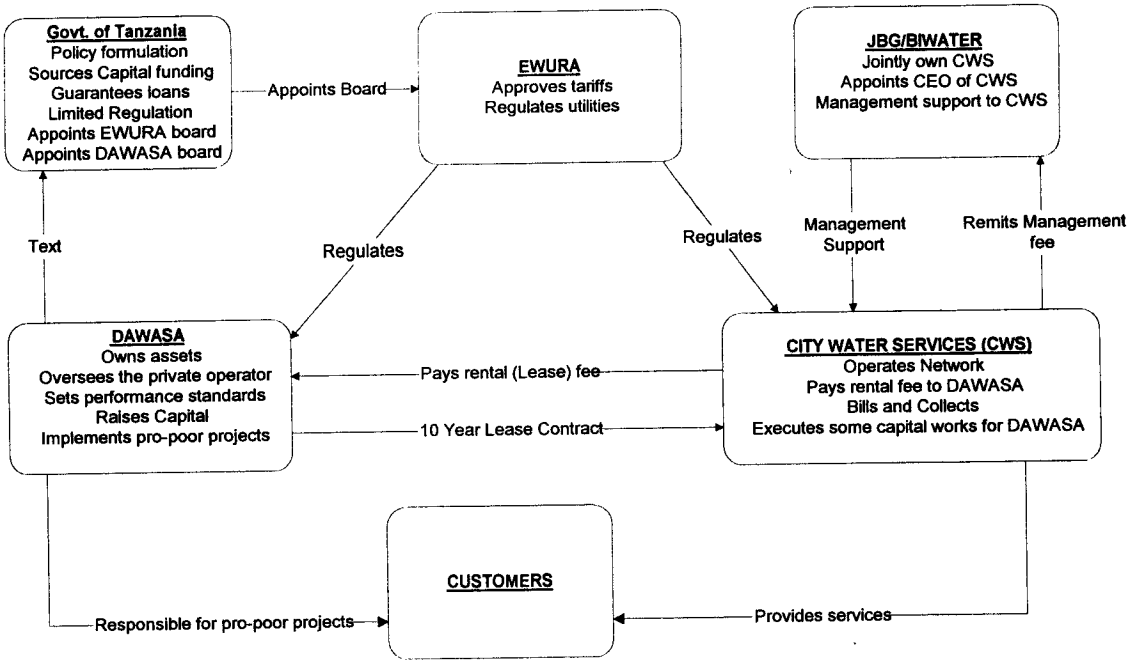
- promoting effective competition and economic efficiency

- protecting the interests of consumers
- protecting the financial viability of efficient suppliers
- promoting the availability of regulated services to all consumers including low income, rural and disadvantaged consumers
- enhancing public knowledge, awareness and understanding of regulated sectors
- taking into account the need to protect the environment

The functions of EWURA are to;

- perform functions conferred on the authority by sector legislation
- issue, renew and cancel licenses
- to establish standards for goods and services
- to establish standards for the terms and conditions of supply of goods and services
- to regulate rates and charges
- to monitor performance of the regulated sectors in relation to;
  - (i) levels of investment
  - (ii) availability, quantity and standard of services
  - (iii) the efficiency of production and distribution of services

Fig 10: Illustration of the institutional arrangement for PSP contract in Dar Es Salaam



4.2.2.5 Tariffs

(a) Tariff structure

According to the EWURA Act of 2001, it is stated in Part II section 7 that, one of the functions of the regulatory authority shall be to *"regulate rates and charges"*. The service provider would have to apply for approval of any proposed tariffs prior to their adoption and usage.

In the agreement between CWS and DAWASA-PGA, a new customer tariff has been provided for which will be effective on the contract commencement date. The new "water supply customer tariff" shall consist of an "operator tariff", "a lessor tariff" and a "first time water connection fee (FTWSCF)". The sewerage customer tariff will consist of an "operator tariff" and "lessor tariff". Table 4.13 below shows the various tariffs;

Table 4.13: Tariffs per category of consumer

PROJECTED INITIAL CUSTOMER TARIFFS (IN US $/m3)		
Water supply		
Operator tariff	0.322	
First time water supply connection fee	0.024	
Lessor (DAWASA) tariff	0.086	
Total		**0.432**
Sewerage		
Operator tariff	0.100	
Lessor tariff	0.029	
Total		**0.129**

Source: Terms of reference DAWASA-CWS agreement

This "customer tariff" is compatible with the on-lending conditions between GOT and DAWASA which are specified in the Development Contract. It reflects the assessed willingness to pay for the WSS service.

- The private operator will bill and collect all tariffs and thereafter transfer collections of the lessor tariffs to DAWASA on a weekly basis.
- Customer tariff components will be reviewed annually on the anniversary of the commencement date based on indexation formulas as per Table 4.14 below;
- The re-negotiation of the entire tariff structure shall be done before the end of year five (midway through the lease contract) for the remaining five-year period in the contract.

(b) Tariff indexation

Table 4.14: Indexation of tariffs

Tariff type	Basis of indexation formula to be used
FTWSCF	Local price inflation
Lessor	Local price inflation
Operator	Local and Foreign price inflation, and Foreign exchange rates

Source: www.dawasa.org

(c) Non-Domestic Water Supply Tariff

The existing non-domestic water supply tariffs are higher than the newly agreed customer tariffs. The difference between the tariffs billed to non-domestic customers and the customer tariffs will be accrued to DAWASA.

(d) The First Time Water Supply Connection Tariff (FTWSC)

The FTWSCF will be deposited in a special bank account maintained by the private operator to be used solely to finance new domestic water connections. The private operator will not charge domestic customers for new connections up to 20m but instead withdraw a fixed fee per new domestic connection from the FTWSCF. The FTWSCF operator fee is intended to cover the cost of pipes and accessories, excluding meters and related installation costs i.e. labor, tools, plant hire etc.

(e) The Lessor (DAWASA) Tariff

This will mainly cover DAWASA's operating costs and debt service and contribute to the capital expenditure programme.

(f) The "Life-Line" Tariff

Provision has been made to make water more accessible and affordable for those in the low- income brackets. There are so many unplanned settlements in the city where most of the low- income groups reside. In many other cases however, there is a mixture in some neighbour-hoods of both the "rich" and the "poor". Identification in this case is done by basing the poor on the quantity of water consumed per month.

A special tariff to be known as the LIFE-LINE tariff shall be adopted applicable only on the first $5m^3$ of water consumed every month for low income households and stand pipe (plot) connections. This tariff shall be equal to the water supply operator tariff only. Further incentives relate to free connection to customers requiring a connection not exceeding 20m (using a half inch diameter pipe) from the supply mains.

A comparison of the rates that the low-income groups currently pay for water supplied through Small Scale Independent Providers (SSIP) and the life-line tariff is given below;

Average Cost of a 20L (jerry-can) Water from a SSIP	**US$**	**0.10**
This translates to	**US$**	**5.00 per m^3**
New Life –Line Tariff (Operator tariff)	**US$**	**0.32 per m^3**

The variance shows that it costs up to 15 times to get water delivered via a SSIP.

Other provisions for service to the poor are contained in the Dar Es Salaam Water Supply and Sanitation Project (DWSSP). One major component is this project is the Community Water Supply and Sanitation Project (CWSSP).

4.2.2.6 Service provision to the poor

The Community Water Supply and Sanitation Project (CWSSP):

This project will be implemented directly by DAWASA with the assistance of specialized NGO's who shall assist beneficiary Community Based Organisations to establish Water and Sanitation Committees. These Committees are to be trained and assisted to formulate "requests for project grants" from DAWASA (after project appraisal is done based on criteria in the Project Operational Manual). The rules and procedures for the project implementation stage will be set out in an agreement. It is envisaged that with the skills acquired by the communities during the implementation stage, they would also be able to manage the new installations after project completion ultimately enhancing project sustainability.

This project shall cost a total of US$ 3.85 million and is part of the DWSSP under the overall Capital Investment Programme (CIP). The financing for this programme is outlined on Table 4.15.

Table 4.15: Project Financing for the CWSSP (US $ million)

Name of Institution	Percentage	Amount
International Development Association (IDA)	58.4%	2.25
African Development Bank (AfDB)	26.0%	1.00
European Investment Bank (EIB)	Nil	Nil
DAWASA	15.6%	0.60
City Water Services (CWS)	Nil	Nil
Total		**3.85**

Source: DAWASA Projects: www.dawasa.org

The total financing to the CWSSP represents 2.4% of the total project cost for the DWSSP.

4.2.2.7 Capital Investment plans

The DWSSP shall be the main vehicle through which major rehabilitation, expansion and other interventions are to be effected on the physical infrastructure with the ultimate goal of improving overall operating efficiency it shall dwell on the development of water intakes, water treatment areas, water-pumps, replacement of water supply lines, universal metering and studies for future expansion.

This project shall be divided into five main components namely;

- Rehabilitation and extension of water supply facilities
- Rehabilitation and extension of wastewater facilities
- The CWSSP
- Institutional strengthening
- Preparation of the medium term WSS development programme

(a) The Implementation of Capital Projects

The implementation shall take place between mid 2003 and mid 2008. Table 4.16 outlines the various works, implementing agency and financier.

Table 4.16: Project Implementation

Works	Funded by	Implemented by
Non Delegated Work Programme (NWDP)	IDA, AfDB and EIB	DAWASA
Delegated Work Programme (DWP)	IDA and AfDB	CWS for DAWASA
CWSSP	IDA and AfDB	DAWASA and NGO's
Institutional Strengthening	IDA	DAWASA
Preparation of WSS Development plan	AfDB and IDA	DAWASA and MOWLD

Source: DAWASA Projects: www.dawasa.org

EIB European Investment Bank

IDA International Development Association

AfDB African Development Bank

(b) Financing for the Dar-Es-Salaam Water Supply and Sanitation Project

The total project cost is US$ 164.6 million, funded by several financial institutions led by the World Bank (IDA). Table 4.17 outlines the various financiers and level of involvement of each.

Table 4.17: Summary of the Project cost and Financing plan in US $ million

Component	Total	IDA	AfDB	EIB	DAWASA	CWS
Water Supply	106.05	36.33	35.55	25.80	8.70	NIL
Waste water	22.40	2.50	9.95	8.30	1.75	NIL
CWSSP	3.85	2.25	1.00	NIL	0.60	NIL
Institutional Strengthening	25.00	13.95	1.50	NIL	1.05	8.50
Development Programme	6.15	5.65	NIL	NIL	0.50	NIL
Refinancing of PPF's	1.15	1.15	NIL	NIL	NIL	NIL
Total	**164.60**	**61.50**	**48.00**	**34.00**	**12.60**	**8.50**
Total (%)	**100%**	**37.4%**	**29.2%**	**20.7%**	**7.7%**	**5.7%**

Source: DAWASA Projects: www.dawasa.org

4.2.2.8 Performance Targets

The expected improvements in the overall level of service after 5 years are;

- Piped water supply service will be continually provided to a minimum pressure for a least 70% of the population in the City.
- The quality of water to be produced must meet Tanzanian standards.
- 80% of the wastewater generated by users connected to the network is to be collected and treated to conform to Tanzanian standards.

- Low-income households to be offered low cost water connections.
- Low-income households to benefit from the "lifeline" tariff.
- Low-income households that cannot have access to piped water to have access to financing for alternative systems and will be provided with assistance for managing the systems.
- Unaccounted for Water (UFW) to be reduced to 35% from 55%.
- Combined collection ratio of both public and private bills to reach 80%.
- The "Customer tariff" shall cover both the Operational and Maintenance (O&M) cost, service debt and partially support future investments.

4.2.2.9 Management of Political interests

Government has changed its attitude as far as payment for bills accrued by itself (including institutions dependant on it for funding). Government has now began to promptly pay for services rendered to it. Since government was the main driver of the reform process, it is ensuring that these reforms succeed.

4.2.3 ASSET HOLDING COMPANY – MINING MUNICIPAL SERVICES (AHC-MMS), ZAMBIA

AHC-MMS provides water supply, sewerage collection, treatment and disposal, solid waste collection and disposal to all the former residential and commercial establishments located in the mining towns the Copperbelt province of Zambia.

The mining companies that were formed on the Copperbelt in the 1920's provided housing and associated municipal services which included sewage collection and treatment, solid waste collection and disposal to name a few, to their employees as part of their conditions of employment. Upon nationalisation of the mines by the Zambian Government in 1968, this service delivery arrangement was continued by the government owned mining conglomerate Zambia Consolidated Copper Mines (ZCCM) Ltd.

Government's approach to the overall operation, management and ownership of the mining industry changed drastically in the mid-nineties, moving away from full state control to a privately managed scenario. Hence with the impending privatization of the mines, it emerged that the new owners (private sector) would opt to concentrate on the core business of mining copper and its by products, rather than shouldering the extra responsibility of providing municipal services. As a consequence therefore, the many housing units were sold to the sitting tenants in the mid to late nineties following a government directive and new policy aimed at increasing private ownership of housing amongst the citizenry which at the same time reduced the burden of providing accommodation on employers.

In order to avert the likely occurrence of a severe drop in standards of municipal service provision it was decided that an institution be set up to assume this responsibility. A Task force was therefore formed and charged with identifying modalities for continued provision of these services. In 1998 the Task force drew up a plan to transform the services from mine ownership to private sector ownership. AHC-MMS was established

as a result in March 1999 and became fully operational in October 1999. It is a private company limited by shares and is wholly owned by the Zambia Consolidated Copper Mines (ZCCM) Investments Ltd, which itself is a state owned company supervised by the Ministry of Finance and National Planning.

Private Sector Participation Contract – Copperbelt Province, Zambia

The Task Force that drew up the plan to oversee the continuance of provision of WSS services to ex-ZCCM areas, recommended that operational responsibility should transfer from the mine owners (public) to the private sector. This plan is in three distinct stages as outlined on Table 4.18;

Table 4.18: Stage by stage layout of transformation from ZCCM provision to PSP arrangement

Stage No.	Activity
One	New mine owners continue to provide services
Two	Competent operator to take over from the new mine owners until inception of Commercial Utilities (CU). Main objective in this stage is to transform the "no cost to the consumer" service into a viable business venture. This led to formation of AHC-MMS and contracting of a private operator under the Mining Township Services Project (MTSP).
Three	Final stage will be to transfer services to CU's or a private operator

(a) Contract general information

Name of Private Operator: SAUR INTERNATIONAL of France

Type of contract: Performance Based Management Contract

Duration: 4 years commencing in 2000

Assets: Public ownership to be retained under responsibility of AHC-MMS, which is the Asset Holding Company (AHC) on behalf of GRZ

Staff in service: The private operator shall not be the employer of the operations staff in service. These staff shall be remunerated fully by AHC-MMS. They shall however be under the responsibility of the private operator for their daily assignments i.e. the private operator shall manage these staff from an operational perspective only.

(b) Allocation of responsibilities:

Main responsibilities of AHC-MMS are;

- In charge of all operations and maintenance costs
- Management of Head Office staff
- Disbursement of fees payable to the private operator
- To monitor the performance of the private operator
- Payment of all wages and salaries to the operations staff
- Hiring, firing, discipline etc., of all the operations staff after recommendations from the private operator
- Contracting out the rehabilitation works
- Procurement of all works, goods and services

Main responsibilities of the private operator are;

- Determination of day to day staff assignments and location of the operations staff and the subsequent evaluation of their performance
- Operation, Maintenance and Repair works of the systems, plant, equipment and other facilities of AHC-MMS
- Management, including procurement and supervision, on behalf of AHC-MMS of the rehabilitation works

4.2.3.1 Tariff structure

The Tariff structure in place has several distinct bands namely;

(a) Un-metered connections consisting of Residential, Commercial and Government Institutions.

(b) Metered connections consisting of Residential, Commercial, Government Institutions, Bulk water and stand pipe

For domestic consumers, the rates differ according to the "housing status". The tariffs do however cater for the poor. For example in the "Un-metered category" the tariffs are as shown on Table 4.19 as follows;

Table 4.19: Tariffs for different consumer categories (Un-metered)

Housing Category	Water Tariff	Waste-water Tariff	Total
Managerial	69,300	27,720	97,020
High Cost	15,480	6,192	21,672
Medium Cost	13,385	5,354	18,739
Low Cost	11,550	4,620	16,170

Source: AHC-MMS Tariffs December 2001

Analysis of the above indicates that the poor pay only 17% of what the highest domestic consumer pays. This implies that the poor enjoy a subsidy.

4.2.3.2 Service provision to the poor

Apart from the subsidized tariff there are components within the MTSP which focus on the upgrading of infra-structure both for water supply and sewerage, which in turn will upgrade the living standards of the poor and also increase accessibility.

4.2.3.3 Capital Investment plans

The main vehicle through which capital investments are to take place during the life of the PSP option chosen is the Mining Township Services Project (MTSP), which is to run from the year 2000 to 2004. The main objective of the MTSP is to, "facilitate the completion of the privatization of ZCCM by supporting the provision of efficient and reliable water supply services, wastewater services and solid waste management in mine townships during a transitional period following the privatization". Some of the main objectives of the project are;

- Cost reduction and cost recovery arrangements leading to the release of GRZ from the heavy financial burden of the systems

- Improved financial management to enhance the sustainability of the system
- Environmental benefits from more efficient water usage and reduction in environmental degradation

Some of the expected outcomes of this project are;

- The project will act as a pilot to demonstrate the effectiveness and efficiency of privately managed services; and will test the regulatory authorities' skills and provide skills for capacity building within NWASCO.
- Through various metering options, consumers will be able to monitor their water usage and make informed choices with regards to quantity consumed and price.

Contractual arrangements

The project consists of several inter-related contractual agreement between GRZ, the International Development Association (IDA), the AHC-MMS and the private operator. The Development Credit Agreement (DCA) is between the IDA and the Republic of Zambia. IDA has provided SDR 28 200 000 (equivalent to US $37 700 000) to the Republic of Zambia for expenditures related to the MTSP. Table 4.20 outlines the application of the funds during the life of the contract.

Table 4.20: Application of the funds in United States Dollars

Category	Expenditure Category	Allocation	Sub Totals	%age of expenditure to b financed
1	Management Contract	6,417,021	6,417,021	100%
2	Civil Works	14,772,518	14,772,518	100% foreign, 95% local
3	Goods	4,545,390	4,545,390	100% foreign, 95% local
4	Consultant Services		4,077,482	100%
4a	AHC-MMS	1,336,879		
4b	HIV/AIDS	200,532		
4c	Municipal Institutions	2,540,071		
5	Training		334,220	100%
5a	AHC-MMS	200,532		
5b	MLGH	133,688		

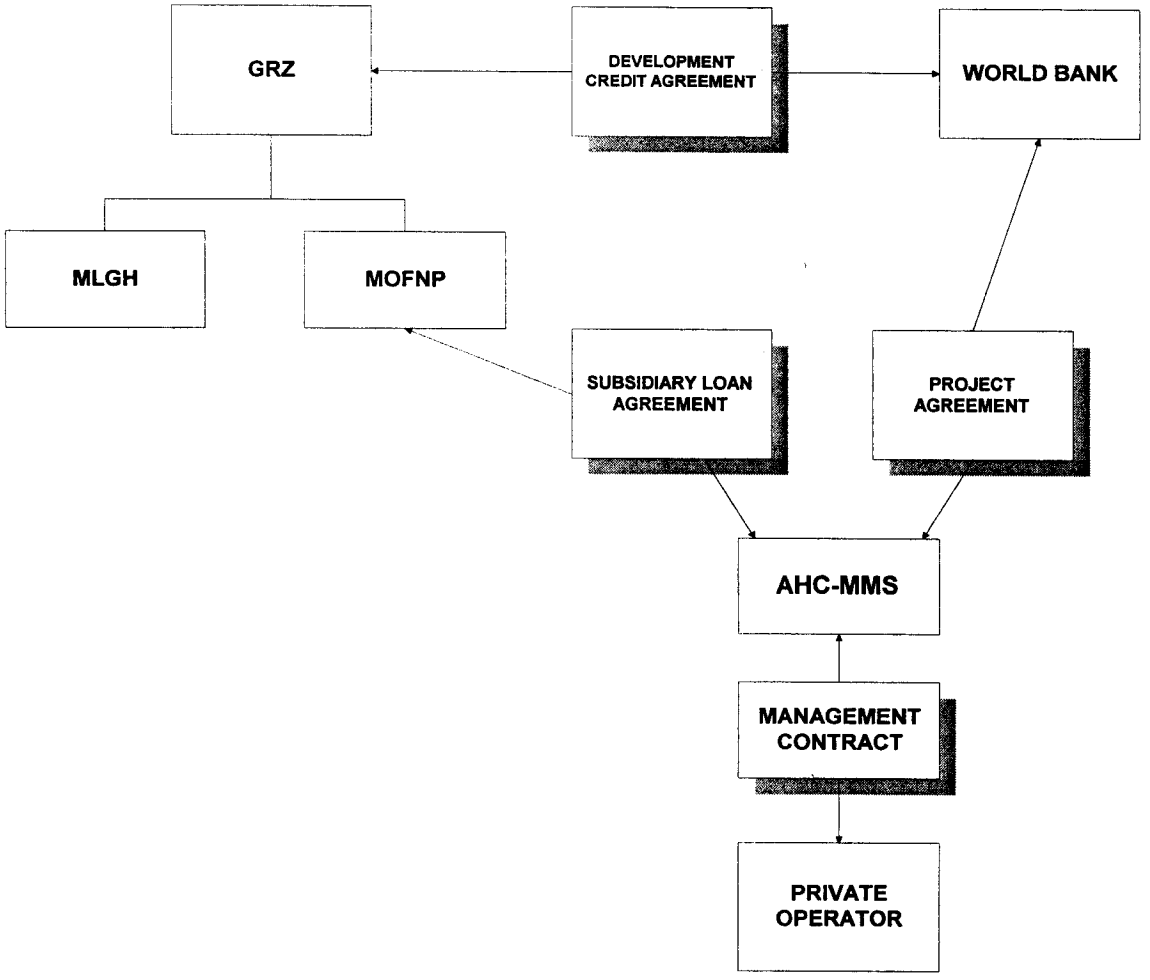
Category	Expenditure Category	Allocation	Sub Totals	%age of expenditure to financed
6	Operating Costs	1,871,631	1,871,631	95%
7	PPF Refund	2,005,319	2,005,319	
8	Unallocated	3,676,418	3,676,418	
	TOTAL	37,700,000	37,700,000	

Source: MTSP Project Implementation Manual

- *The loan agreement between IDA and the Republic of Zambia is repayable over a period of about 40 years*
- *Under "percentage of expenditure" in Row Nos 2 and 3, Foreign refers to a case when the contractor/supplier engaged is from outside Zambia the payments shall be 100% from IDA funds whilst Local refers to a case whereby the contractor/supplier engaged is from within Zambia and the payments shall be apportioned thus; 95% from IDA funds and 5% from Zambian counterpart funding.*

Fig 4.11 shows a diagrammatic representation of the contractual arrangements layout between IDA and the Republic of Zambia.

Fig 4.11: Contractual arrangements layout



MLGH - Ministry of Local Government and Housing
MOFNP - Ministry of Finance and National Planning

4.2.3.4 Performance Standards and Incentives

The performance standards are outlined in the "Performance Standards Appendix" which is part of the main Management Contract document. Some of the targets are;

- **Un-accounted For Water (UFW)**

  This is to be reduced from the Base Year value by 70% during the life of the contract.

- **Constancy of Supply**

This is defined as an average percentage of the time in which 100% of the customers have piped water supply available during the peak season (April through October). The Operator will install sufficient recording devices (flow and or pressure measuring devices), financed from the "Repair and Rehabilitation Fund (RRF)".

$$\textit{Average \% of continuous flow} = \frac{\textit{Number of recorded hours of flow for April to October}}{\textit{7 months * 720 hours per month}}$$

The Constancy of supply is to be increased by 27.5% in four years.

- **Installation, Repair and Replacement of meters**

To achieve 100% by the end of Year Four.

- **Installation of bulk meters**

To achieve 100% by end of Year Two

The Performance Incentives shall be calculated based on agreed formula. Compensation is calculated as follows;

*Compensation = Composite Score*0.2*Maximum Annual Performance Incentive Compensation*

Where: *Composite Score = Total of all weighted scores for Performance Criteria*

4.2.4 LUSAKA WATER AND SEWERAGE COMPANY, ZAMBIA

Lusaka Water and Sewerage Company (LWSC) Ltd. is a utility company responsible for the provision of water supply and sewerage services to the Capital City of the Republic of Zambia, Lusaka. The City of Lusaka is the largest city and also the administrative center of Zambia. It extends over an area of approximately 360 square kilometers with a total estimated population of 1,100,000 inhabitants rising at an annual growth rate of 3.6% (GRZ, 2000b).

4.2.4.1 General Organisation of LWSC

LWSC was registered on 24th April, 1988 as a private company under the companies Act of the Republic of Zambia. The sole shareholder is the Lusaka City Council (LCC), which was formerly the service provider to the City through its Engineering Services Department. The company is headed by a Managing Director who is answerable to a board of directors appointed by the shareholder LCC consisting of persons drawn from both the public and private sector. The organisation chart for the senior management is as shown on Fig 4.12.

Fig 4.12: Organisation layout for senior administrative staff at LWSC

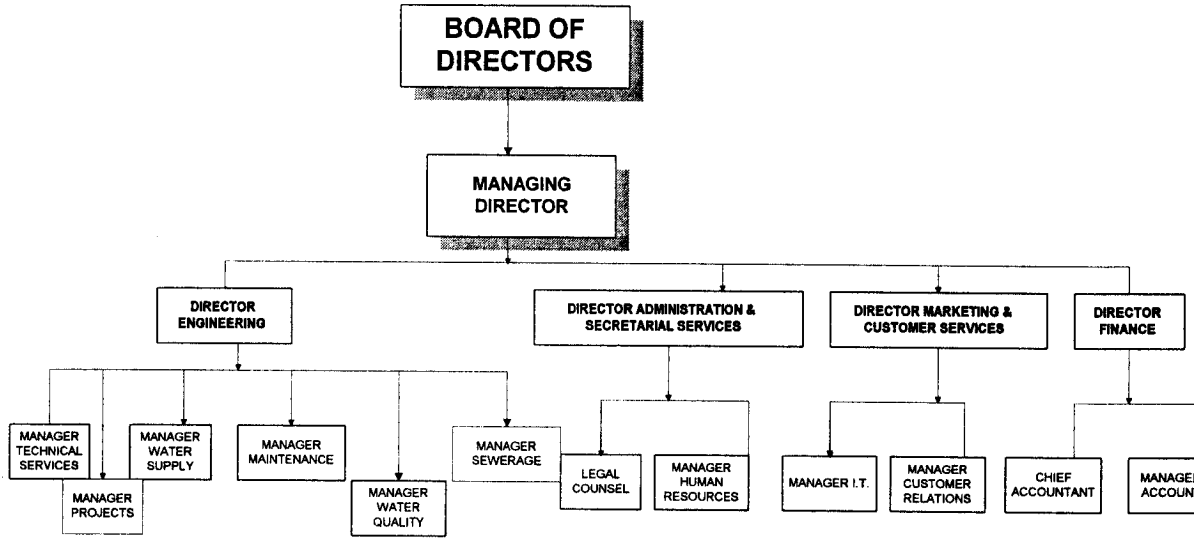
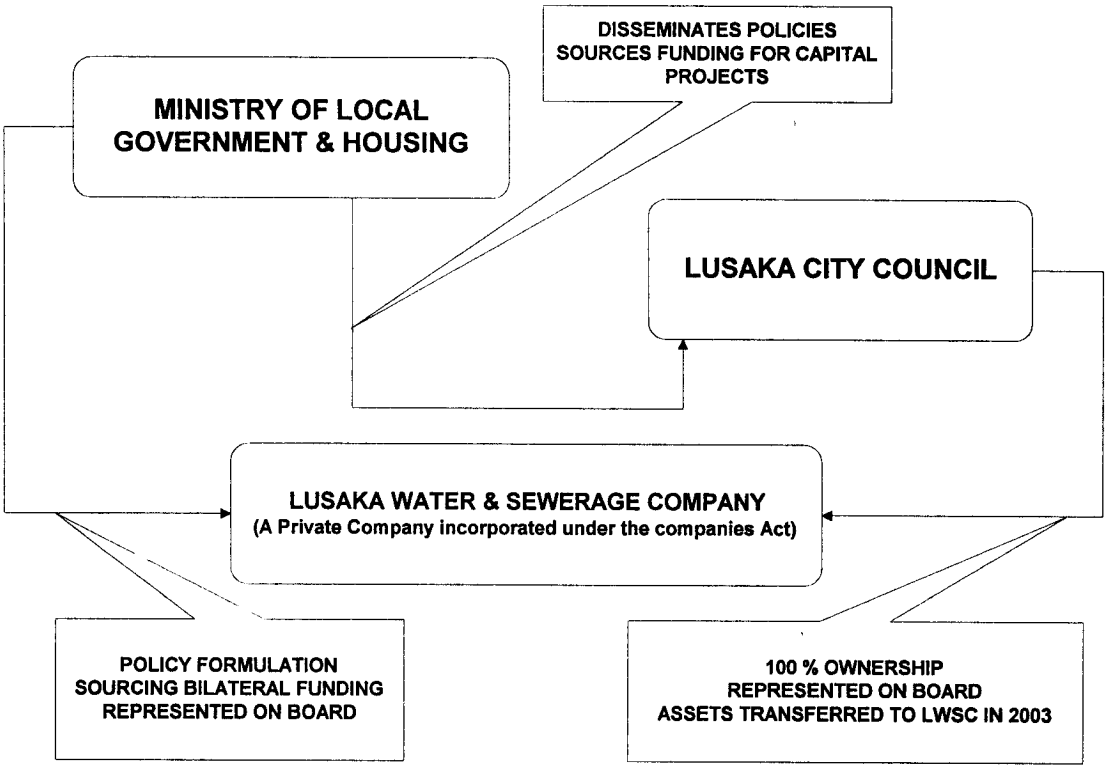


Fig 4.13, illustrates the organisational relationships between these various institutions.

Fig 4.13: Organisational relationship between the Lusaka City Council, Government (MLGH) and the Lusaka Water and Sewerage Company



- Government control and involvement in the LWSC is still maintained through representation on the board and its strong relationship with LCC.
- Due to financial constraints, the shareholder (LCC) is unable to contribute to share-capital, which impacts negatively on LWSC's operation.

4.2.4.2 Water Supply

The City of Lusaka's water supply is drawn from two sources namely;

- Underground sources (Boreholes)
- Surface water source (Kafue river)

Originally (prior to 1969), all the water supplied was drawn from boreholes. Due to rapid expansion of the city and general population growth it was decided to augment the

existing supply with surface water drawn from the Kafue River, located 55km south of Lusaka. The Kafue Water Treatment plant was initially designed to treat 45000 cubic meters per day. Further upgrades were effected to the treatment plant between 1970 and 1979 bringing the total capacity to 110,000 cubic meters per day. Expansion activities were also effected to the borehole sources bringing the total contribution from the boreholes to 100,000 cubic meters per day, from a total of about 50 boreholes. The current number of customers is 38,000 consisting of 5,000 in the commercial category and 33,000 in the non-commercial category.

The City (service area) has been divided into districts (zones) for ease of management, operations and monitoring (see attached map, "Domestic Metering Status-March 2003). Bulk meters have been installed to mains supply lines at the entry and exit points to each Zone so as to facilitate accounting for total water supplied versus water billed, which also enables for accurate estimation of unaccounted for water.

The Harza/Rankin feasibility study of 1993, projected water demand trends for the City of Lusaka as shown in Table 4.21.

Table 4.21: Projected water demand trends for the City of Lusaka

Year	Population	Average daily water demand (m3/day)	Maximum daily water demand (m3/day)
1995	1,112,798	252,244	341,566
2000	1,323,022	287,825	390,157
2005	1,515,341	319,810	433,839
2010	1,679,339	346,372	470,187
2015	1,811,011	367,541	499,149
2020	1,911,709	383,708	521,253

- *The current production levels from both the underground and surface water sources is approximately 210,000 cubic meters per day.*

- *The Kafue River is capable of supplying double the current volume of water extracted, which together with the existing underground sources will be able to cater for population projections for the year 2015. The major constraint to this proposition is that there would have to be expansion works effected to the treatment works coupled with the laying of a new 60kms pipeline to Lusaka City and extensive network refurbishment within the city.*

There are about 50 Borehole sites in use in Lusaka which draw water from the aquifer underlain beneath it. Main risks associated with this source of water relate to pollution from sewage seeping from poorly constructed pit latrines, contamination from solid waste and agricultural chemicals. Continuous monitoring of the quality of water drawn from the boreholes is therefore an absolute necessity coupled with enforcement of restrictive measures on developments undertaken in close proximity to the boreholes.

With regard to the surface source, flow in the Kafue river is regulated upstream at the Itehzitezhi dam, which was built in the 1970's to act as the main storage reservoir for the Kafue Hydro-Electric power station located downstream from the Iolanda water intake gates. The Kafue district sewerage treatment works located 10kms upstream discharges untreated effluent into the river, which poses as a threat to the security and safety of Lusaka's water supply due to pollution. Due to limited financial and human resource capacity at the Kafue district water works, it is suggested that the LWSC takes over the management and operation of the Kafue sewerage treatment works.

4.2.4.3 Water Treatment, Transmission, Storage and Distribution infrastructure

The general condition of the water treatment civil infrastructure is good overall, despite evidence of minor cracks and spalling on a few concrete walls. However, the Mechanical and Electrical equipment is in dire need of refurbishment and replacement. There are requirements for interventions to be effected on various components of the transmission, storage and distribution infrastructure. The intervention works of the various components of the entire water supply network and the estimated implementation costs are given in Table 4.22, below.

Table 4.22: LWSC Treatment, Transmission, Storage and Distribution facilities

Component	Description of works	Objective	Cost (
Treatment Works	• Replacement of intake and high lift pumps and other maintenance works	• Increase availability of water to the city	8,500,
Transmission Mains	• Installation of surge equipment, air-valves, washouts and thrust blocks	• Strengthening Mains to take additional flow	1,000,
Boreholes	• Pump and motor refurbishment, and upgrading of chlorination equipment • Drilling and equipping of new boreholes	• Improvement of water quality and availability • Continuity of supply and system expansion	8,000,
Storage	• Rehabilitation of existing reservoirs • Construction of new reservoirs	• Continuity of supply • Increasing storage capacity	10,700
Distribution	• Upgrading, refurbishment and replacement of degenerated and corroded mains pipes	• Continuity of supply, improvement of water quality and reduction of Unaccounted For Water	27,500
Metering	• Installation of bulk meters, improvement of data logging and telemetry	• Reduction of Unaccounted For Water and improvement of Billing	5,000,
New Development Areas	• Mains supply to 20,000 properties • Ground water supply and reticulation to newly developed areas • Improvement of supply to peri-urban areas in general	• Increase of Service Area coverage • Increase of Service Area coverage • Increase of Service Area coverage	31,750
TOTAL CAPITAL REQUIRED			**90,450**

4.2.4.4 Water quality

In order to closely monitor the water quality levels, LWSC operates two water quality testing laboratories, one located at the Iolanda water treatment works and the other at the "old" water-works in Libala. For sampling purposes the entire supply area has been divided into zones whereby, samples are regularly collected and tested to ascertain their conformity with the World Health Organisation (WHO) guidelines.

In 2001, a customer service survey was conducted by LWSC to verify the customers' perceptions on the current service levels rendered by it. The results of this exercise indicated that one of LWSC's most positive attributes was that of 'supplying water of good quality'. Water borne disease outbreak is key indicator of water quality. However, several outbreaks have occurred in the various peri-urban areas, which have been primarily as a result of poor sanitation practices exacerbated by unregulated solid waste disposal.

4.2.4.5 Sewerage services

The waterborne sewerage system covers only about 34% of the city serving a population of about 300,000. The rest of the city relies on "on site-sanitation" namely, septic tanks and pit-latrines. The general condition of the sewerage disposal infrastructure is well below the minimum basic standards required and is in dire need of extensive rehabilitation and expansion in order to adequately cater for the needs of the existing and future projected population levels.

LWSC operates two conventional and five non conventional sewage treatment facilities.

Conventional Treatment Plants

The removal of dissolved and colloidal organic matter from the wastewater is done through a biological reactor. The phases in the treatment process are outlined below;

- **Preliminary Treatment** This phase consists of the screening process, grit removal and communition (shredding of sewage solids).
- **Primary Sedimentation** The gravitational separation of the suspension into solid and liquid phases.
- **Secondary Treatment** The liquid effluent from the primary sedimentation tanks is distributed over a circular bed of coarse aggregate in a mechanism known as the trickling filter. The bacteria that is contained in the microbial film that forms around the filter media, oxidizes the sewage as it flows past it, that is conversion of the dissolved organic matter in the influent into particulate form. The solid matter is then removed through the secondary sedimentation process.
- **Maturation ponds** These are shallow ponds where microorganisms and other nutrients from the influent are removed aerobically.

Non Conventional Treatment Plants

In this process three types of ponds are used namely;

- **The Anaerobic ponds** The anaerobic ponds are basically open unmixed basins designed to enhance the settling and biodegradation of particulate organic solids by anaerobic digestion.
- **The Facultative ponds** The operating principle of the facultative ponds is to balance the oxygen input by photosynthetic algae and the oxygen demand exerted by the organic matter degradation.
- **The Maturation ponds** These are shallow ponds where microorganisms and other nutrients from the influent are removed aerobically.

Table 4.23 gives a breakdown of the treatment plants, year of construction, design flows and the approximate average flows in the year 2000.

Table 4.23: Sewage treatment facilities operated by LWSC

Name of plant	Year Constructed	Design Capacity (m3/day)	Average Measured flow (m3/day)	Comments
Manchinchi STP	1959 to 1980	36000	44200	Overloaded
Matero WSP	1968	7100	900	Underutilised

Name of plant	Year Constructed	Design Capacity (m3/day)	Average Measured flow (m3/day)	Comments
Chunga STP	1973	9100	10000	Slightly Overloaded
Ngwerere WSP	1969	8350	3800	Underutilised
Kaunda Square WSP	1970	3600	6500	Overloaded
Chelstone WSP	1972	2700	9000	Overloaded
Garden MP	1972	29000	55,000	Overloaded

Source: Lusaka Water and Sewerage Company, Proposal for Rehabilitation of Sewage Handling and Treatment Facilities (2000)

STP Sewage Treatment Plant

WSP Waste Stabilisation Ponds

MP Maturation Ponds

- *The construction period for Manchninchi Sewage Treatment Plant commenced in 1959 and has undergone several upgrades up to the year 1980*

It is clear from Table 4.23 that the LWSC operated sewage treatment facilities are severely overloaded and there is a desperate need for urgent intervention measures. An assessment of the costs required to upgrade the infrastructure is outlined in Table 4.24 below;

Table 4.24: Cost and description of works required to the Sewage Network for Lusaka City

Description of works	Estimated cost (US $)	Summary of key interventions
Sewage pumping stations	2,500,000	• Repair of pump and valve chambers, security fencing and external lighting • Pump repair, replacement and supply of standby facilities
Conventional Sewage Treatment Plants	7,500,000	• Repainting of pump houses • Repair of concrete structures • Repair and replacement of pump motors, gearbox mechanisms, valves

Description of works	Estimated cost (US $)	Summary of key interventions
		• Repair and replacement of trickling filter components
Non Conventional Sewage Treatment plants	4,000,000	• Re profiling of embankments and installation of wave protection slabs • Enlarge inlet channels • Construction of new ponds to increase capacity • Removal of all accumulated grit and sludge to restore facilities to design capacities
Expansion of the Sewer Network	70,000,000	• Expansion of the city sewer line grid network to areas that are currently un-served. • Replacement of some sewer lines with larger diameter type to cater for increased volumes
TOTAL	**US $ 84,000,000**	

Source: Lusaka Water and Sewerage Company Proposal Document for the Rehabilitation and Expansion of Sewage handling and Treatment facilities (2000)

4.2.4.6 Capital Investment strategies

There have been several attempts over the years to undertake infrastructure improvements, modernization and expansions in order to adequately serve the growing population. However, despite these interventions, there has not been any significant improvement in overall service levels which are currently well below the minimum optimum levels required. Financing for capital investment stands out as one of the most prominent impediments.

Several reasons can be attributed to this situation such as;

- Inappropriate management styles
- Poor cost recovery

- A lack of confidence and willingness amongst funding agencies to avail funding for these interventions

Some major capital works that have been effected of late are;

1. The Lusaka Water Supply Rehabilitation Project, Phases I and II financed through a loan provided by the African Development Bank (ADB)
2. The George Complex Water Project funded through a grant from the Japanese Government.

The North West Lusaka Water Project whose main purpose is to improve the supply of potable water to western areas of the city, where the main industrial and commercial areas as well as about 20% of the residents are located. However these interventions fall well below the required minimum as has been outlined on Tables 4.22, 4.23 and 4.24.

4.2.4.5 Tariffs, Billing and Collections

Tariffs:

According to the Water Supply and Sanitation Act, tariff adjustments by a utility can only be effected after approval is granted by NWASCO. The applicant service provider is required to provide information in a proposal outlining certain key aspects of the utility's operations.

The tariff structure for the City of Lusaka consists of various bands which are dependent on the volume consumed, type of connection and consumer and the "socio-economic" status of the area.

Tables 4.25a and 4.25b outline the tariffs in use from June 2002.

Table 4.25a: Tariff bands for LWSC

Domestic customers		**Commercial customers**	
Consumption block in m3	Amount in ZMK per m3	Consumption block in m3	Amount in ZMK per m3
0 to 6	400	0 to 100	680
6 to 30	480	100 to 170	1500

Domestic customers		Commercial customers	
30 to 100	680	Above 170	1650
100 to170	1500		
Above 170	1650		

Table 4.25b: Other Tariff bands LWSC

Other Charges	Fee (ZMK)
Household with individual taps per month	12,000
Communal taps (per household)	3,000
Sewerage services (Percentage of water consumed for commercial)	80%
Sewerage services (Percentage of water consumed for domestic)	50%

Billing and Collections:

The general billing and collections for the years 2001 to 2003 are given on Table 4.26.

Table 4.26: Billing and Collections by LWSC from 2001 to 2003

Year	Collections (US$)	Billings (US $)	Collection Ratio
2001	4,010,000	5,152,000	78%
2002	4,610,000	6,232,000	74%
2003	5,250,000	6,715,000	79%

Source: Lusaka Water and Sewerage Company Documentation

Operational Costs:

The total operational costs consist of the following;

- Personnel costs

- Chemical costs
- Energy costs
- Other miscellaneous costs

Table 4.27 gives a breakdown of total operational costs for the years 2002 and 2003.

Table 4.27: LWSC Operational costs for 2001 and 2002

	Personnel (US $)	Chemical (US $)	Energy (US $)	Other (US $)	Total (US $)
2001	1,780,000	260,000	1,650,000	1,890,000	5,580,000
2002	3,090,000	250,000	1,750,000	1,380,000	6,470,000
% Change	+ 74%	- 4%	+ 6%	- 27%	+ 16%

Source: NWASCO (2003)

- *There has been an increase of 16% overall in total operational costs, largely attributed to personnel costs which have increased by 74%*

4.2.4.6 Service provision to the poor

The majority of the "customer-base" in the City of Lusaka resides in the informal settlements otherwise commonly referred to as the "peri-urban" areas. Banda (2002) states that, *"between 60 to 70% of the total population of Lusaka reside in these areas"*. However provision of water supply and sanitation services poses as a great challenge to the utility company due to many social, economic and technical factors. The main characteristics of these areas are;

- High population
- Overcrowding
- Haphazard layout of houses and other social infrastructure
- Poor quality sanitation and solid waste mechanisms
- Generally poor environmental conditions overall
- High rates of vandalism to public infrastructure

The most common methods used to provide supply to these areas in Lusaka are;

- Yard connections
- Individual household connections
- Public (communal) stand posts

Some attempts have been made to improve service provision in some areas. The "George Complex Water Supply Project" is one such venture which was funded by the Japanese Government at a total cost of US $ 25 million. George Complex is one of the largest low-income settlements in Lusaka consisting of seven sub compounds with a total estimated population of 120,000. Table 4.28 below outlines the key events in the evolution process of this project.

Table 4.28: Sequence of events that culminated in the implementation of the George Complex Water Supply Project

No	Event details
1	George developed spontaneously as a squatter settlement in the 60's on previously used farmland.
2	Some sections of George were legalized and upgraded in the 70's by the Local Authority
3	Initially the Local Authority provided communal stand pipes to the entire complex
4	The stand pipes were poorly maintained and heavily vandalized by the communities
5	High UFW and network losses due to excessive leakages as a result of vandalism and wear and tear
6	Availability of water reduced partly due to these losses forcing residents to source from shallow wells
7	High probability of shallow wells water being polluted due to excreta from pit latrines and poor solid waste disposal mechanisms
8	Persistent outbreaks of water borne diseases as a result of poor sanitary conditions. High incidence of death in 1991-1992 rain season
9	GRZ requested for assistance from the Government of Japan (GOJ) to improve facilities
10	GOJ accepted to finance and implement the project in 1993

Some key features/experiences of the George Project:

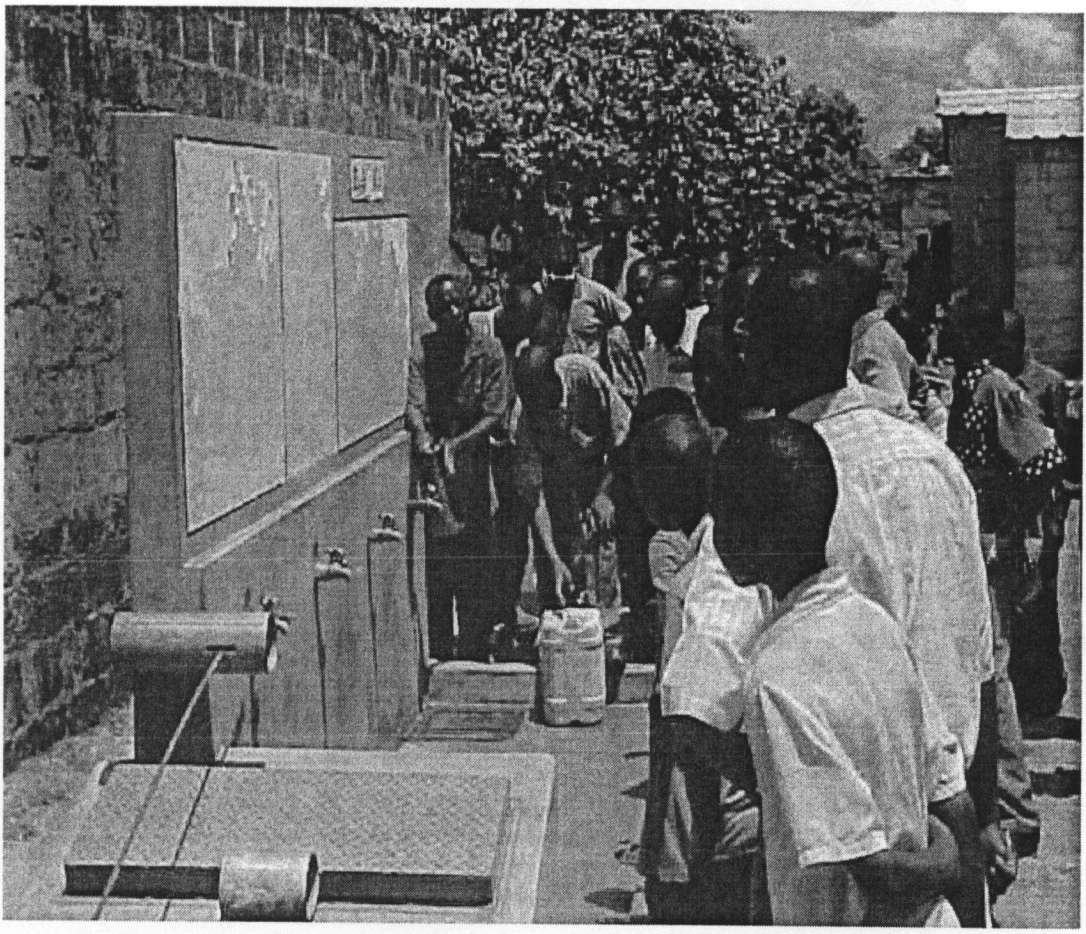
(i) To enhance operational efficiency, the George area was divided into eight water supply areas.

(ii) Each area had an independent water supply system managed by the local community with technical and logistical support from LWSC.

(iii) A high sense of ownership by the community exists due to involvement of the community from the inception stage.

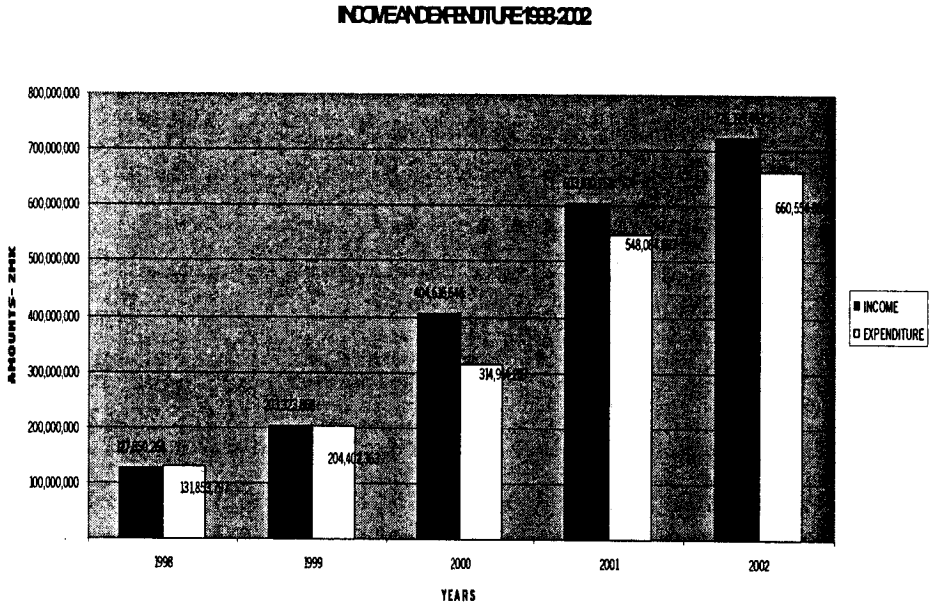
(iv) Appropriate technology was used evidenced by reduced vandalism due to robust design of facilities and minimal defect occurrences

Fig 4.14: Illustration of a FAUCET facility in George Compound



(v) Collection rate of 70% which covers the operational costs and a reserve fund for minor asset replacements (Ref Fig 4.15)

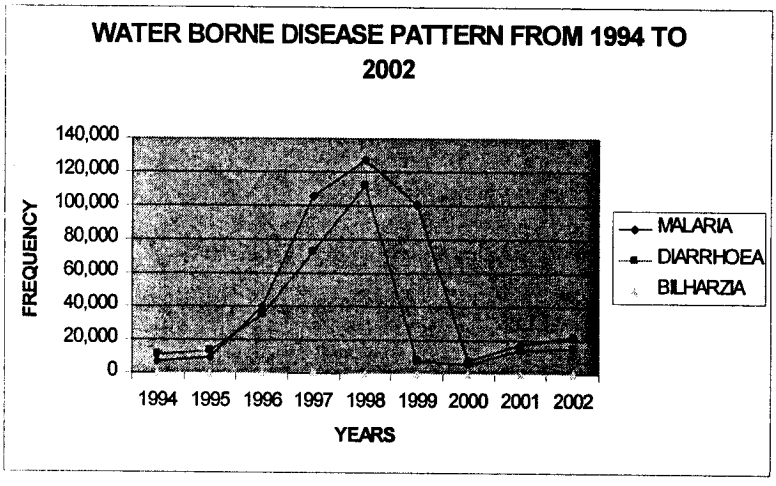
Fig 4.15: Income and expenditure trends in George Compound



- *Income over expenditure has exhibited continuous growth over the years*

(vi) There has been an increase in access to clean safe water evidenced partly by a reduction in disease outbreak (Ref Fig 4.16).

Fig 4.16: Water borne disease pattern in George from 1994 to 2002



Source: Assembled using data from the George Water Complex Project

- At project inception (1994-1995) water borne disease occurrence was very low due to availability of clean water from the newly constructed facilities.
- Some residents reverted to drawing "free" water from shallow wells located within their premises in the period 1996 to 1998, which resulted in high incidence of water borne diseases.
- The lessons learnt in the period 1996 to 1998 resulted in high usage of water supplied by the project as most consumers who had developed their own sources of supply, reverted to using the "much safer supply" from the project.

4.2.4.7 Private Sector Participation

LWSC has not had any private sector participation management option apart from the many "service contract" arrangement with various specialist contractors who have provided specific specialist services over an agreed period. However, there was a technical assistance facility financed by the German Government whose main objective was to enhance technical and commercial performance to the newly established utility in 1990. Experts in various key fields were engaged to work side by side with local counterpart staff. This contract extended over a six year period. Some improvements in performance were achieved in that a more commercially oriented atmosphere was created even though the contracts structure did not provide for any performance related incentives which are cardinal in a PSP contract.

The Kafue Bulk Water Supply Scheme

This project sought to bring about private sector investment in the form of the "Build Operate Own and Transfer" (BOOT) format. The basic approach entailed the forming of a BOOT company that would be responsible for the design, financing, construction and operation of the bulk water supply requirements to the LWSC. Two companies submitted bids.

The review and evaluation panel recommended that, *"LWSC at its current levels of tariffs, debtor recoveries and billing rates is unable to afford the BOOT scheme. Taking*

on of the BOOT scheme would have required significant investments in the reticulation and sewerage systems both of which require colossal amounts of funding which at present poses as one of the most serious challenges to the company's operations".

The options preferred from most to least preferred were as follows;

1. **Staged implementation** of the BOOT project pending operational improvements in LWSC and enter into negotiations with the panel's preferred bidder for interim technical assistance.
2. **Proceed immediately** with the BOOT project and enter into negotiations with the panel's preferred bidder.
3. **Re-tender** the BOOT project with a lease contract for the management of LWSC.
4. **Cancel** the BOOT project and terminate the tender process.

One of the main objectives of PSP is to bring to the fore operational and technical expertise, which are at present absent or not fully developed in the publicly owned company. In this proposed arrangement, the commercial and technical responsibility (i.e. for the distribution network) would be retained by LWSC. These two areas are the ones where expertise is most needed, hence the BOOT project would not have yielded the expected improvements to service provision in Lusaka.

CHAPTER FIVE

5. ANALYSIS

5.1 COMPARATIVE ANAYLSIS OF THE THREE PRIVATE SECTOR PARTICIPATION (PSP) CASES

A comparative analysis of the three organisations that have adopted Private Sector Participation for service provision was conducted. These are;

(i) City of Kampala, Uganda where there is a Management Service Contract operated by ONDEO Services of France through a locally incorporated company called OSUL Uganda Ltd.

(ii) City of Dar Es Salaam, Tanzania where there is a Lease Contract operated by a joint venture between J.B. Gauff of Germany and Biwater Plc of the United Kingdom through a locally incorporated company called City Water Services Ltd.

(iii) Copperbelt Province of Zambia in the areas previously serviced by the former mining conglomerate in Zambia, Zambia Consolidated Copper Mines (ZCCM) Ltd., where there is a Management Contract operated by SAUR International of France.

In general terms, the status of service provision in the cases of Uganda and Tanzania had degenerated to very low levels and the whole service provision arrangement was unsustainable. Other factors were;

- High levels of UFW
- Poor and dilapidated infrastructure
- Low collection ratios
- A large proportion of the total coverage area who are poorly or in some cases not served.

The case of AHC-MMS is different since the main objective behind its formation lies with facilitating the smooth privatisation process for the Zambian mining industry (who

were the service providers) and also to prepare the ex- mine supplied areas for amalgamation with the main local authority owned service providers.

5.1.1 General Comparison

Several similar key parameters were compared and contrasted highlighting the extent to which the parameters relate, corroborate, contradict, correct and debate each other. The comparison has been undertaken using a "Point by Point" format whereby comparable points from each case were alternatively discussed. The findings for each parameter discussed were placed in Tabular form.

Table 5.1: Policy Framework

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Policies formulated through the Water Policy Committee (WPC), which is established by an Act of Parliament.	• Policies formulated through a consultative process amongst key stakeholders.	• Policies formulated through a consultative process amongst key stakeholders.
• Current National Water Policy (NWP) reviewed in 1997 primarily due to desire to attract investment in the sector and improve service provision.	• Current NWP was launched in 2002 replacing the 1991 NWP. Objective was to move away from emphasis on central government's roles of investor, implementer and manager of the service delivery process.	• NWP was launched in 1993, prompted by a quest to effect a fully sustainable service delivery process and to attract investment in the sector.
• The framework for adoption of PSP as a means of service provision was set out in the National Water Policy.	• The NWP explicitly provides for sourcing of private sector investment in the Urban Water Supply and Sanitation sector.	• The NWP aimed at devising mechanisms required to encourage investment in the service delivery arena.

Comments:

(i) The National Water Policies in all cases are formulated through consultation of key stake holders though in Uganda the formulating body is established through an Act of Parliament.

(ii) The review of the NWP in all three cases was primarily prompted by the desire to address the inherent problems in the sector the most prominent being the attraction of external capital and investment in the sector and the move away from Government's current levels of involvement in service provision namely that of sole investor, service provider and regulator.

Table 5.2: Legislative Framework

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Legislation provides for the parastatal body, NWSC to enter into partnerships with the private sector for service provision. • Ownership of assets to be retained by NWSC.	• Legislation provides for the parastatal DAWASA to enter into partnerships with the private sector for service provision. • Ownership of assets to be retained by DAWASA.	• Legislation provides for Local Authorities to enter into partnerships with the private sector for service provision. • Ownership of assets to be retained by the Local Authority or the utility company formed by the Local Authority.

Comments:

(i) All changes to the legislative instruments associated with service provision provided for entering into of partnerships with the private sector.

(ii) The new legislation in all cases provided for ownership of assets being retained by the publicly owned authority.

Table 5.3: Institutional Framework

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Private operator hired by the Asset Holding Company which in turn reports to the Ministry responsible for water affairs. • The Asset Holding Company	• Private operator hired by the Asset Holding Company which in turn reports to the Ministry responsible for water affairs. • The Asset Holding Company	• Private operator hired by the Asset Holding Company which in turn reports to the Ministry of Finance and National Planning. • The Asset Holding Company

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
is a parastatal company owned directly by the government	is a parastatal company owned directly by the government	is a parastatal company owned directly by the government

Comments:

(i) Government involvement in all three cases is at the level of the Asset Holding Company i.e. direct and or indirect appointment of Board of Directors and ultimate supervision of the Boards.

(ii) Provision of Guarantees for loans from bi-lateral institutions is sought from central government.

(iii) Facilitating the enactment of new legislative provisions.

Table 5.4: Regulatory Framework

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Regulation conducted directly by Government departments and other specialized statutory bodies.	• Independent Regulator (Energy and Water) established through an Act of Parliament in 2001 prior to adoption of PSP	• Independent Regulator established through an Act of Parliament in 1999 prior to adoption of PSP.
• Performance standards set out by Government Ministry responsible for Water affairs.	• Performance standards set out by EWURA.	• Performance standards set out by NWASCO.
	• Regulator Funded directly from a percentage of the tariffs realised by the utility companies.	• Funded through Government grants and a percentage of the tariffs realised by the utility companies.

Comments:

(i) Uganda has no independent regulatory body in place though there is a quest to establish one in future. The Government still plays an active role in this arena.

(ii) Both Tanzania and Zambia have independent water supply and sanitation regulatory bodies in place, established prior or at about the time PSP was adopted.

(iii) The Tanzanian regulatory agency, EWURA, is multi-sectoral i.e. it caters for both the energy and water sectors. This funding mechanism in this case is more assured and reliable primarily because of high levels of revenue realised from the petroleum segment of the energy sector.

Table 5.5: Private Sector Participation Options

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Management Contract (Two years with option for extension by One year).	• Lease contract (Ten years duration).	• Management Contract (Four years duration).
• Private operator remunerated from monthly revenues.	• Private operator remunerated from gross monthly revenues after payment of monthly lease fee to DAWASA.	• Private operator remunerated directly from a loan obtained from the International Development Association (IDA).
• Bonus payments disbursed to the private operator if certain performance related targets are achieved.	• No bonus payments provided for in the Lease contract, but the private operator executes some minor capital works for DAWASA.	• Bonus payments disbursed to the private operator if certain performance related targets are achieved.
• Minor capital works undertaken by the private operator at an agreed fee.	• Minor capital works undertaken by the private operator at an agreed fee.	• Minor capital works undertaken by the private operator at an agreed fee.

Comments:

(i) For the Management Contract service delivery arrangement adopted in Uganda and Zambia, there is a difference in the mode of payment of the fixed monthly management fee to the private operator. In Uganda the funds are sourced from revenues collected from the customer base whilst in Zambia the funds are sourced from the loan obtained from the IDA. The deficiency with

the Zambian arrangement is that the private operator's fee is guaranteed thus severely reducing the incentive to enhance performance whilst the opposite is the case in Uganda as the payments are drawn from the collections made by the private operator which will enhance the private operator's performance.

(ii) In all cases there is a quest to reduce upon the water lost by undertaking leakage repairs, eradication of illegal connections and provision of more meters which will improve upon metering levels.

(iii) In Uganda and Zambia the private operator has an incentive to realise more money if certain pre-agreed performance based bench mark targets are attained such as reduction in UFW and increased metering.

(iv) In the Lease Contract for Tanzania, the private operator has a great incentive to improve upon operational efficiency since the monthly revenue is not fixed and has no limit, but is directly dependent on the total sales volume realised.

Table 5.6: Raising of Capital with each option

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Funding for rehabilitation and expansion works secured from bilateral funding institutions after adoption of PSP.	• Funding for rehabilitation and expansion works secured from bilateral funding institutions after adoption of PSP. • DAWASA encountered major problems to secure funding for capital works prior to adoption of PSP.	• Funding for rehabilitation and expansion works secured from bilateral funding institutions after adoption of PSP.

Comments:

(i) Bilateral institutions reluctant to fund capital works in a "public sector" managed service delivery arrangement.

(ii) Funding for capital works from bilateral institutions linked to the adoption of PSP service delivery arrangement in all three cases.

Table 5.7: Capital Investment Strategies

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Rehabilitation and expansion of water treatment works, storage facilities and the distribution network. • Reduction in water losses through repair of leakages, increased metering and connections.	• Rehabilitation and expansion of water treatment works, storage facilities and the distribution network. • Reduction in water losses through repair of leakages, increased metering and connections. • Institutional capacity building of staff in service. • Preparation of a Water Supply and Sanitation development plan.	• Rehabilitation and expansion of water treatment works, storage facilities and the distribution network. • Reduction in water losses through repair of leakages, increased metering and connections. • Water resources management study for the Copperbelt province. • Increase awareness of HIV/AIDS throughout the service area and to assist the workers and their families affected by it.

Comments:

(i) The capital obtained from the bilateral funding institutions in all three cases is targeted at enhancing the overall operating efficiency through network infrastructure repairs and refurbishment.

(ii) Tanzania and Zambia have invested some resources for attending to issues concerned with water resources management, which does not seem to be a serious issue in Uganda due to abundant raw water availability.

Table 5.8: Tariffs

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Revisions can only be effected after prior approval is sought from the Government.	• Revisions can be effected after approval is granted by EWURA.	• Revisions can only be effected after approval is granted by NWASCO.

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Tariff adjustment based on adjustment formula.	• Tariff adjustment to be reviewed annually based on an indexation formula.	• Tariff adjustment based on review of tariff proposal submitted by the service provider to NWASCO.
• Life-line tariff for the poor in place at US $ 0.25 per cubic meter	• Life-line tariff for the poor in place at US $ 0.32 per cubic meter	• Life-line tariff for the poor in place at US $ 3.00 per month fixed.

Comments:

(i) Tariffs revised after prior approval is granted by the independent regulatory bodies in Tanzania and Zambia.

(ii) In Uganda, the Government grants approval based on a tariff adjustment formula.

(iii) In all three cases the annual adjustments are based on similar parameters namely; cost of electricity, foreign exchange rates and inflation rates.

(iv) The system in Uganda and Tanzania is more predictable as it is dependent on a pre-set formula which can be applied once there is a fluctuation on any one of the key parameters outlined in the formula as opposed to the Zambian method which is subject to discussions amongst the Regulatory Authority's Board members who may be unwilling to effect the changes under external pressure from politicians, societal pressure groups etc.

Table 5.9: Unaccounted For Water

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Reduction from 44% in base year to 33% at the end of the contract.	• Reduction from 55% in base year to 35% at the end of the contract.	• Reduction by 70% on base year value by the end of the contract.

Comment:

(i) A key performance indicator in all three cases is the reduction in UFW levels. This reduction is expected as direct consequence of repairs to the network

infrastructure and effecting of increases in metering and connection rates to customers.

Table 5.10: Service provision to the poor

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• Fully Subsidised "Life – Line" tariff for the poor which is based on a minimum monthly consumption and does not cover the Operational and Maintenance cost. • Project to increase access for the poor in place, administered by the Asset Holding Company.	• Fully Subsidised "Life – Line" tariff for the poor which is based on a minimum monthly consumption and does not cover the Operational and Maintenance cost. • Project to increase access levels for the poor in place, administered by the Asset Holding Company. • Subsidised connection rates for the poor.	• Fully Subsidised "Life – Line" tariff for the poor which is based on a fixed monthly water and sewerage tariff. • Project to improve the infrastructure servicing the poor in place administered by the Asset Holding Company.

Comment:

(i) The projects that pertain to improvements in service provisions to the poor are administered by the Asset Holding Companies in all three cases primarily due to the inherent socio-economic factors. Addressing issues that relate to increasing access for the poor does not feature prominently as an attractive proposition for the private sector mainly due to the many complexities associated with it such as the legal status of residents residing in some peri-urban areas, the haphazard layout and distribution of housing units, rampant vandalism all which makes it very difficult to administer the billing and collection functions during the service delivery process.

Table 5.11: Human Resource Issues

Uganda (NWSC)	Tanzania (DAWASA)	Zambia (AHC-MMS)
• The staff in service to be transferred to the private operator who assumes responsibility for their monthly wages (and not pensions and long service gratuities). This condition is outlined in the "service contract" between NWSC and the private operator.	• The staff in service to be transferred to the private operator as per conditions outlined in the DAWASA Act.	• The staff in service to be retained by the Asset Holding Company. The staff shall be under the direct responsibility of the private operator for their daily assignments.

Comments:

(i) The staff arrangements for Uganda and Tanzania place responsibility on the private operator for managing and remunerating those inherited from the Asset Holding Company as they are transferred at inception of the contract.

(ii) The arrangement for Zambia does not place responsibility for remuneration of staff on the private operator.

(iii) The Zambian arrangement absolves the private operator of acts as a dis-incentive for the private operator to adhere to strict and efficient usage of manpower.

5.1.2 Analysis of performance – Uganda (NWSC)

A number of key performance indicators were included in the Management Contract between the Asset Holding Company (NWSC) and the private operator OSUL Ltd. The "base-line" values are compared against the values at the end of "year one". Table 5.12 gives a breakdown of these values.

Table 5.12: Performance indicators outlined in the NWSC PSP contract

Indicator	Base Year Value (BYV)	Target Year One (TYO)	Year One Value (YOV)	Progress	Under/ Over
Volume of water delivered (m3)/Month	2,811,913	2,930,000	2,986,015	+6%	+2%
Volume of water billed (m3)/Month	1,561,985	1,765,000	1,732,440	+11%	-2%
Unaccounted for Water (%)	44%	40%	42%	-2%	+2%
Billed amounts (US $)/Month	805,711	910,450	964,026	+20%	+6%
Collections without arrears (US $)/Month	783,921	950,300	817,935	+4%	-14%
Collections from GOU (US $)/Month	111,516	210,750	155,779	+40%	-26%
Active connections (No)	33,050	39,070	38,659	+17%	+1%
Inactive connections (No)	10,783	8,760	11,637	+8%	-33%
Number of connections (No)	43,833	47,830	50,296	+15%	+5%
Connection efficiency	75%	80%	77%	+2%	-3%
New connections	473	525	511	+8%	-3%
Metering efficiency	90%	91%	93%	+2%	+2%

Source: Management Services Contract for the Kampala Water Supply area, Year 1 Report, NWSC-OSUL

Assessment of the performance attained by the private operator indicates general upward improvements in almost all the key measured parameters. However the private operator has failed to attain some of the targeted values which are outlined in the contract. This is attributable to many impeding factors. The private operator, ONDEO Services states in NWSC (2003) that some of the originally set out targets were unrealistic and un-achievable and needed to be amended. Some of the targets proposed for amendment were;

1. Unaccounted for Water – decrease by 4%.
2. Reduction in value of water billed to correspond with the new UFW value.
3. Reduction in the connection efficiency value by 2%.
4. The total Collection values

This situation clearly shows that the targeted values initially set out will require revision during the life of the contract.

5.1.3 Analysis of performance – Tanzania (DAWASA)

The key performance indicators were not analysed in this study as the PSP contract had been in existence for less than a year at the time of concluding this study (April, 2004)

5.1.4 Analysis of performance – Zambia (AHC-MMS)

A number of key performance indicators were included in the Management Contract between the Asset Holding Company (AHC-MMC) and the private operator SAUR International Ltd. The "base-line" values are compared against the values at the end of "year one". Table 5.13 gives a breakdown of these values.

Table 5.13: Performance indicators outlined in the AHC-MMS PSP contract

Indicator	Base Year Value (BYV)	Targeted Value – Year 4	Value after Year 3 of the contract	Comment
Unaccounted for Water	67%	30%	37%	Targeted value is likely to be attained
Metered Connections	0%	15%	15%	Target has been attained and is likely to be exceeded
Collection efficiency	0	92.5%	80%	Target likely to be attained
Operational cost to revenue collected ratio	0	1	Greater than 1	Full cost recovery attained

Source: NWASCO (2003) and AHC-MMS documentation

Generally service levels have improved as evidenced by the various values attained amongst the key indicators. This is largely because of availability of capital with which these interventions can be effected and also the generally well laid out array of the housing and commercial units within the entire service area.

5.2 SITUATIONAL ANALYSIS OF THE LUSAKA WATER AND SEWERAGE COMPANY

A situational analysis on the current status of the Lusaka Water and Sewerage Company was conducted in order to assess the overall organisational framework, existing performance levels and to identify the main factors that adversely impact on good quality standards of service provision in a publicly owned utility.

5.2.1 Analysis of LWSC performance

A detailed outline of the key performance standards used to measure a utility's performance were enumerated in Chapter 2.2.5. Table 5.14 gives the actual performance levels attained by LWSC and compares these against internationally accepted standards as stated in WUP (2001b).

Table 5.14: Comparison of actual performance levels for LWSC (2001/2002 and 2002/2003)

Indicator	2001/2002	2002/2003	Minimum standard	Comments
UFW	58%	58%	Less than 20%	No improvement
Metering ratio	31%	32%	-	Very slight improvement
Collection efficiency	56%	76%	Greater than 95%	An improvement has occurred but still well below the targeted standard
Staff/1000 connections	14	15	Less than 5	Staffing levels are actually increasing indicating that overstaffing is a problematic issue
Water Service Coverage	68%	70%	Greater than 90%	Improvement but still well below the set target.
Hour of Supply	15 hrs	15 hrs	20 to 24 hrs	No improvement and still well below target
Sanitation Service Coverage	34%	33%	-	No improvement

Sources: Urban Water Supply Sector reports for 2001/2002 and 2003/2003 by NWASCO

Generally the overall performance of LWSC based on the indicators in Table 5.14, shows that there isn't any significant improvement in service delivery to the consumers in the service area.

It is not possible for service levels to improve significantly but the overall coverage increased under the current operational framework. Tables 4.23, 4.24, 4.25 and 4.26 underscore this assertion.

5.2.1.1 Coverage

Currently the coverage by Lusaka Water and Sewerage Company over its service area is 70% for water supply and 33% sewerage services (these values are based on the population in the service area) . These coverage ratios indicate that the existing coverage levels are inadequate and measures ought to be effected to extend and expand the existing network if accessibility is to be increased.

5.2.1.2 Capacity and condition of the water supply infrastructure

The general condition of the water supply infrastructure indicates that an immediate refurbishment programme is inevitable if service levels are to be sustained let alone improved. Continued lack of tangible capital investment and funding for periodic and routine maintenance will continually result in poorer infrastructure and lower levels of operational efficiency. Major features that need immediate intervention are outlined in detail in Tables 4.22 and 4.24. The key recommended measures are;

- Development of new ground water sources to service newly developed areas.
- Extraction of raw water from former quarry sites to augment the City's current sources of supply.
- Repair of defective overhead storage facilities, which shall improve "back up" capacity required during peak demand periods.
- Identification of illegal connections and institution of measures to regularize them, most especially in the peri-urban areas.

The infrastructure currently produces approximately 210,000 cubic meters per day. This volume of water falls well below the estimated average daily demand for Lusaka City as analysed below;

Current daily production from Kafue River and Boreholes	*210,000 cubic meters*
Estimated average daily demand (Harza/Rankin, 1993)	*300,000 cubic meters*
Shortfall per day	***90,000 cubic meters***

- *The daily demand is arrived at using the sum total of the products of the population residing in a particular service area and its average per capita consumption rate.*

With population increase and growth of industries and settlements, it is envisaged that by the year 2015, the average daily demand for Lusaka shall be approximately 370,000 cubic meters which implies that the current levels of daily production of water should double. This finding indicates that investment in the network ought to be undertaken immediately.

5.2.1.3 Capacity and condition of the Sewerage system

The sewage treatment facilities consist of two conventional treatment plants and five non conventional treatment plants (i.e. waste stabilization ponds). Tables 4.23 and 4.24 both give a description of the treatment plants i.e. year of construction, current loading and design capacities.

All the major treatment facilities are excessively overloaded with inflows in some cases at volumes exceeding double the design flows as shown below;

Manchinchi Sewage Treatment Plant overloaded by	***9000 m3/day (25%)***
Chunga Sewage Treatment Plant overloaded by	***900m3/day (10%)***
Kaunda Square Waste Stabilisation Ponds overloaded by	***6000m3/day (80%)***
Chelston Waste Stabilisation Ponds overloaded by	***6000m3/day (200%)***
Garden Maturation Ponds overloaded by	***26000m3/day (90%)***

This situation implies that the sewage is not adequately treated as the treatment mechanisms are both hydraulically and organically overloaded. In some cases the excessive influent is made to completely by-pass the treatment plant to avoid "choking" of the mechanisms. The resultant effect is that the effluent discharged into the receiving waters is not in conformity with the standards set out by the Environmental Council of Zambia (ECZ), which leads to pollution of the environment. From Table 4.23 it was established that the total average daily flow is into all the treatment plants is 66000 cubic meters (ref Table 4.23), representing about 24% of the total water supplied per day to the city.

Expansion measures are therefore required to enable the facilities to adequately cater for the current and projected levels of inflow and also to improve on the removal of total suspended solids and reduction of Biochemical Oxygen Demand (BOD) to minimum accepted levels. The key recommended measures are;

- Rehabilitation and up rating of trunk mains sewage pumping apparatus to cater for increased volumetric loads
- General rehabilitation and expansion of the existing treatment plants
- Construction of new treatment plants to cater for both the present and future inflows which are primarily as a result of changing population, more people upgrading to water borne sanitation and general economic growth (e.g. establishment of new industries).

5.2.1.3 Financial requirements to Refurbish and Expand the infrastructure

Tables 4.22 and 4.24 give a detailed description of the costs required to effect significant improvements and expansion; thereby substantially increasing the service coverage ratios to the water supply and sewerage collection and treatment infrastructure for the city of Lusaka are summarized in Table 5.15;

Table 5.15: Total infrastructure improvement capital costs

Description	Cost in US $
Water supply network	90,450,000
Sewerage collection and treatment network	84,000,000
Total	**174,450,000**

This investment requirement according to the Lusaka Water and Sewerage Medium Term Asset Management Plan and Capital Investment Programme is slated for implementation over a 15 year period.

A comparison between the billing, collections (ref Table 4.26) and total production costs (ref Table 4.27) is given in Table 5.16 below;

Table 5.16: Comparison of Billing, Collection and Production Costs for LWSC

	Billings (US $) A	Collections (US $) B	Total Production Costs (US $) C	Surplus/Deficit (US $) C – B
2002	6,232,000	4,610,000	5,580,000	(970,000)
2003	6,715,000	5,250,000	6,470,000	(1,220,000)

- The billing excludes the outstanding debts owed by Government and quasi Government institutions which are normally settled through the so called "debt swaps", i.e. Government may waive statutory payment obligations due from LWSC such as tax in exchange for debt write off or arrange for waiving of energy liabilities due with the Government owned Energy utility company.

The above information shows that LWSC operates at more or less "break even" levels with no prospect of any major financing for improvements to the overall service area.

This situation however is not predictable and creates a high level of uncertainty for the service provider as political influence is cardinal for realization of higher revenue.

Measures that are required to be undertaken in order to reduce the deficit outlined in Table 5.16 are;

- Increasing the collections
- Increasing the coverage area (currently at 60% for water supply) so as to increase the customer and revenue base
- Reducing the personnel costs (LWSC has a high staff per 1000 connections of 15 as compared to the optimum level of 5 to 8)
- Reducing the overall production costs through eradication of leakages, increased metering, reduction of illegal connections and usage of more appropriate technology where necessary. This assertion is underscored by the high UFW levels which in 2003 averaged at 58%.

All these factors point to the need for improved technical and commercial management of the system in general coupled with the raising of capital which is needed to effect the changes and improvements required. It is clear however that these factors cannot be attained under the current operational framework. Furthermore, it would not be possible to service loan repayments for a gross capital outlay of US $ 174 million.

5.2.2 The questionnaire results and evaluation

A questionnaire was sent to key officials drawn from the service provider, the Regulatory agencies and bilateral funding institutions. There results collected assisted in the design of the PSP OPTION model for the City of Lusaka. The following results were collected from the respondents to the "Private Sector Participation Model Validation Questionnaire" (Ref Appendix No 2).

Question: *What are the three most prominent problematic areas that are an obstacle to provision of good quality water supply and sanitation services in Zambia?*

Issue	Result (% of the respondents)
Lack of capital for infrastructure rehabilitation and expansion	75%
Low collections from Government (and Government funded institutions) due to poor payment record	50%
Poor commercial management and personnel	50%
Vandalism and poor infrastructure	38%
Political interference	25%

Question: *Do you think the current institutional arrangement is appropriate for enhanced service delivery?*

YES 100%

NO 0%

Though the responses were overwhelming in support of the current institutional set up, there were several conditions attached to this response. These are;

- 63% indicated that this institutional arrangement was alright only if the issue of access to capital for investment and expansion was addressed.
- 25% indicated that it was alright so long as each of the major stakeholders fully played their assigned roles and do not interfere with the functions of other players.

Question: *Do you think the Private Sector's Participation can help to improve current service delivery levels?*

YES 88%

NO 12%

Additional comments to qualify the responses in the affirmative were;

- The Private Sector's Participation should act as a catalyst for accessing of funds needed for capital investment.
- The PSP option selected should be one that will address the inherent deficiencies prevalent in the service areas. Hence the selection process should be meticulously undertaken.

Question: *Which PSP option do you most prefer?*

Option Type	% of Respondents
Performance based Management Contract	38%
Lease	38%
BOOT or BOT	13%
None of the PSP options	11%

- The general opinion was that the LEASE contract would be most preferred since the respondents who selected the Performance based Management Contract indicated that it should be implemented as a prelude to the Lease contract. During this phase, accurate baseline data should be collated for usage during the design stage of the Lease contract.

Question: *Respondents were requested to comment on the proposed service delivery arrangement layout as shown on Fig Nos. 6.2 and 6.3.*

YES 75%

NO 25%

Additional comments were as follows;

Answer type	Comments
YES	• Creates a high level of entrepreneurship amongst "Small Private Operators (SPO) assigned to manage the various zones within the service areas • Can contribute to increasing collection efficiency • Potential SPO's can be found amongst retired and or "laid off" utility staff • The selection process for the SPO should be devoid of political interference

Answer type	Comments
	• The SPO should be well qualified to perform the tasks • Responsibility for UFW and management of the billing system should be clearly stipulated • There should be a high level of willingness to pay amongst the customers for services received
NO	• This arrangement absolves the "Principal Private Operator (PPO)" from responsibility in the peri-urban areas, currently where the highest level of expertise is required • This arrangement can lead to increased overhead costs • This arrangement removes the "cross-subsidisation" of the poor consumers by the rich consumers • This arrangement will not benefit the Asset Holding Company in any way

The results from this questionnaire were used in the development of the Decision Tree and selection of the PSP options for the City of Lusaka, which is outlined in Chapter Six.