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Performance of Water Utilities with Emphasis on Wastewater Services Provision

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Abstract

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Contents

| | |
|--|-----------|
| Abstract..... | 3 |
| Acknowledgements | 3 |
| List of Tables | 5 |
| List of Figures..... | 6 |
| List of Acronyms | 6 |
| 1 Introduction | 7 |
| 1.1 Background..... | 7 |
| 1.2 Problem Statement..... | 9 |
| 1.2.1 What has been looked at? | 9 |
| 1.2.2 What has not been looked at? | 10 |
| 1.3 Objectives | 10 |
| 1.3.1 Other Objectives | 10 |
| 1.4 Propositions | 11 |
| 1.5 Research Questions | 11 |
| 1.6 Summary of the Chapters | 11 |
| 1.6.1 Literature Review | 11 |
| 1.6.2 Methods | 12 |
| 1.6.3 Data and Findings..... | 12 |
| 1.6.4 Discussions | 12 |
| 1.6.5 Conclusions and Recommendations..... | 12 |
| 2 Literature Review | 13 |
| 2.1 Overview | 13 |
| 2.2 Conventional approach to sanitation services | 13 |
| 2.2.1 Public management | 13 |
| 2.2.2 Financing (government subsidies)..... | 13 |
| 2.2.3 Conventional Sewerage | 14 |
| 2.2.4 Limitation of the Conventional Approach for Developing Countries.... | 14 |
| 2.3 Alternative approaches to sanitation services..... | 15 |
| 2.3.1 Management Models | 15 |
| 2.3.2 Financing | 16 |
| 2.3.3 Appropriate technologies..... | 17 |
| 2.4 Characteristics of Well Performing Utilities | 17 |
| 2.4.1 Leadership | 17 |
| 2.4.2 Capacity | 18 |

| | | |
|----------|--|-----------|
| 2.4.3 | Autonomy | 18 |
| 2.4.4 | Government support | 19 |
| 2.4.5 | Commercial Orientation | 19 |
| 2.4.6 | Consumer Orientation | 19 |
| 2.4.7 | Corporate culture | 19 |
| 2.4.8 | Development of human resources | 20 |
| 2.4.9 | External accountability | 20 |
| 2.4.10 | Internal accountability of results | 20 |
| 2.4.11 | Interaction with key external institutions | 20 |
| 3 | Methodology..... | 21 |
| 3.1 | General..... | 21 |
| 3.2 | Desk Study..... | 21 |
| 3.2.1 | Review of Literature | 21 |
| 3.2.2 | Required Data | 22 |
| 3.3 | Field Study..... | 24 |
| 3.3.1 | Introduction of the Research Topic to NWSC | 24 |
| 3.3.2 | Documentary Review | 24 |
| 3.3.3 | Surveys | 24 |
| | Collection of Data from Johannesburg Water | 25 |
| 3.4 | Data Analysis..... | 25 |
| 3.4.1 | Analytical Framework | 25 |
| 3.4.2 | Surveys | 25 |
| 3.5 | Challenges | 26 |
| 3.6 | Brief Description of the Cases..... | 26 |
| 3.7 | Why the above Cases?..... | 26 |
| 4 | Data and Findings | 27 |
| 4.1 | General..... | 27 |
| 4.2 | National Water and Sewerage Corporation, Uganda..... | 27 |
| 4.2.1 | Introduction | 27 |
| 4.2.2 | Wastewater Services..... | 28 |
| 4.2.3 | Population Trends..... | 30 |
| 4.2.4 | Utility Environment (NWSC)..... | 31 |
| 4.2.5 | Conclusions | 43 |
| 4.3 | Johannesburg Water, Johannesburg, South Africa..... | 45 |
| 4.3.1 | Introduction | 45 |
| 4.3.2 | General Performance for the period 2001-2006..... | 45 |
| 4.3.3 | Utility Environment (Johannesburg) | 47 |
| 4.3.4 | Conclusions | 54 |
| 5 | Discussions | 55 |
| 5.1 | General..... | 55 |
| 5.2 | Performance of Utilities..... | 55 |
| 5.3 | Relationship between performance and causal factors..... | 56 |
| 5.3.1 | Organization Autonomy | 56 |
| 5.3.2 | Organization Culture | 56 |
| 5.3.3 | Leadership | 56 |
| 5.3.4 | Customer Orientation | 57 |
| 5.3.5 | Commercial Orientation | 57 |
| 5.3.6 | Technical Capacity | 57 |

| | | |
|----------|---|-----------|
| 5.3.7 | Human Resources Development | 58 |
| 5.3.8 | Internal Accountability | 58 |
| 5.3.9 | External Accountability | 58 |
| 5.3.10 | Interaction with Key External Institutions..... | 59 |
| 5.4 | Regulation..... | 59 |
| 6 | Conclusions and Recommendations | 59 |
| 6.1 | Conclusions | 60 |
| 6.2 | Significance of the Study..... | 61 |
| 6.3 | Recommendations | 61 |
| 6.4 | Future Studies | 62 |
| | References | 63 |
| | Appendix | 65 |
| | Analytical Framework | 65 |
| | Appendix ii: Survey for collecting information of key indicators..... | 72 |
| | Appendix iii: List of People Interviewed | 77 |
| | Appendix iv: List of Documents reviewed..... | 77 |
| | Appendix V: Reward and Penalty Structure (NWSC) | 78 |
| | List of Tables | |
| | Table 2.1 Relative Cost of different technologies | 14 |
| | Table 2.2 Cost Recovery Instruments..... | 16 |
| | Table 2.3 Categorization of manpower for urban sewer systems..... | 18 |
| | Table 3.1 Data Matrix for data collection during field work..... | 22 |
| | Table 3.2 Background of respondents | 25 |
| | Table 4.1 Cost of sewers versus septic tanks analysis..... | 29 |
| | Table 4.2 Breakdown of sanitation coverage in Kampala..... | 29 |
| | Table 4.3 Trends for Service Standards for wastewater | 29 |
| | Table 4.4 Kampala Population Trends and Projections 1991-2015 | 30 |
| | Table 4.5 Indicators for Organization autonomy..... | 31 |
| | Table 4.6 Indicators for leadership | 35 |
| | Table 4.7 Indicators for corporate culture | 35 |
| | Table 4.8 Indicators for customer orientation | 36 |
| | Table 4.9 Water Tariff for NWSC..... | 37 |
| | Table 4.10 Indicators for commercial Orientation | 37 |
| | Table 4.11 Indicators for technical capacity..... | 38 |
| | Table 4.12 Indicators for development of human resources | 39 |
| | Table 4.13 Indicators for internal accountability..... | 40 |
| | Table 4.14 Key indicators for External Accountability..... | 42 |
| | Table 4.15 Indicators for interaction with external institutions..... | 43 |
| | Table 4.16 Indicators on Customer Orientation | 48 |
| | Table 4.17 Tariff Structure for Johannesburg Water..... | 51 |
| | Table 4.18 Indicators on development of human resources | 52 |
| | Table 4.19 Indicators of Internal Accountability..... | 52 |
| | Table 4.20 Indicators of external accountability | 53 |
| | Table 5.1 Table comparing showing performance of NWSC and JW | 55 |

List of Figures

| | |
|---|----|
| Figure 1-1 Global Water and Sanitation Deficit..... | 7 |
| Figure 3-1 Conceptual Frame work for the research..... | 22 |
| Figure 3-2 Research flow diagram | 27 |
| Figure 4-1 Trends in BOD Loading from NWSC Towns | 28 |
| Figure 4-2 A graph comparing water and sewer extensions | 30 |
| Figure 4-3 A graph showing population growth in town with access sewerage facilities | 31 |
| Figure 4-4 Regulation and Service Provision in Uganda’s Urban Water and Sanitation Sub-Sector | 33 |
| Figure 4-5 Percentage of sewage effluent compliance..... | 46 |
| Figure 4-6 Reduction of sewage spills | 46 |
| Figure 4-7 Reduction of chemical usage | 50 |
| Figure 4-8 Power consumption reduction | 50 |

List of Acronyms

| | | |
|--------|---|--|
| AGS | : | Annual Gross Salary |
| AM | : | Area Managers |
| BoD | : | Biochemical Oxygen Demand |
| BODs | : | Board of Directors |
| BOO | : | Build Operate Own |
| BOOT | : | Build Operate Own Transfer |
| BOT | : | Build Operate Transfer |
| CAPEX | : | Capital expenditure |
| CAS | : | Composite Aggregate Score |
| CBO | : | Community Based Organizations |
| DWRD | : | Directorate of Water Resources Development |
| EcoSan | : | Ecological Sanitation |
| EMS | : | Environmental Management System |
| GTZ | : | Gesellschaft für Technische Zusammenarbeit |
| IDAMC | : | Internally Delegated Area Management Contracts |
| LVEMP | : | Lake Victoria Environmental Management Programme |
| MDGs | : | Millennium Development Goals |
| MoWE | : | Ministry of Water and Environment |
| NEMA | : | National Environmental Management Authority |
| NGOs | : | Non Governmental Organizations |
| NRW | : | Non Revenue Water |
| NWSC | : | National Water and Sewerage Corporation |
| IWRM | : | Integrated Water Services Management |
| JW | : | Johannesburg Water |
| JOWAM | : | Johannesburg Water Management |
| KSUP | : | Kampala Sanitation Urban Program |
| O&M | : | Operation and Maintenance |
| PIU | : | Project Implementation Unit |
| OPex | : | Operational expenditures |
| PPDA | : | Public Procurement and Disposal of Public Assets Authority |
| RBM | : | Result Based Performance |
| RoCE | : | Return on Capital Employed |

| | | |
|---------|---|--|
| TSS | : | Total Suspended Solids |
| UBOS | : | Uganda Bureau of Standards |
| UNDP | : | United Nations Development Programme |
| UNICEF | : | United Nations International Children's Emergency Fund |
| UWASNET | : | Ugandan Water and Sanitation Network |
| VIP | : | Ventilated Improved Pit |
| WHO | : | World Health Organization |
| WWTW | : | Wastewater Treatment Works |

1 Introduction

1.1 Background

When one is reading and hearing about water services almost everyone speaks about water supply and sanitation¹ sector. When you listen well or read carefully, however, you will find that in 99% cases they are taking about water supply only and pay little attention to sanitation. The neglect of sanitation side of water services is also visible in the progress made with respect to Millennium Development Goals (MDGs). Whereas a considerable progress has been reported for many countries for halving the population without access to water; the progress with respect to sanitation is minimal.

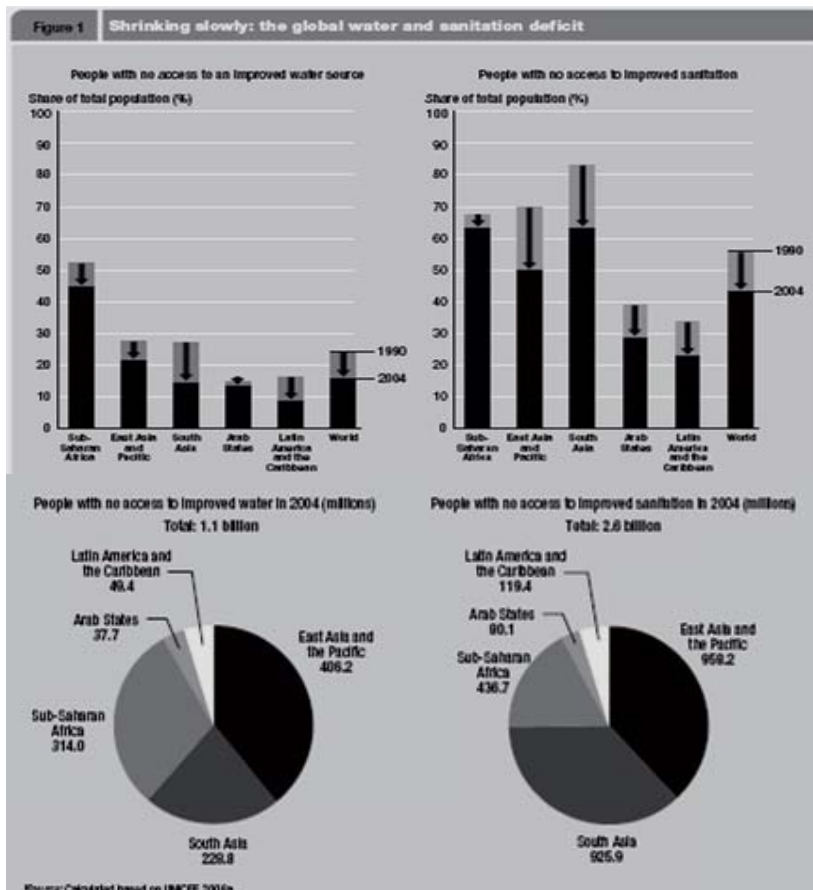


Figure 2-1 Global Water and Sanitation Deficit

¹ Sanitation means the use of practical measures for preservation of public health associated with water supply, sewage and solid waste management and other public health services [Ujang, Z., and M. Henze, 2006]. This research will be limited on wastewater (sewage) management only.

According to the Human Development Report 2006, 2.6 billion people have no access to sanitation (almost half the population of developing nations) compared to 1.1 billion without access to safe water fig.1. This is not to imply that water supply has been handled satisfactorily. In all regions and in almost all countries sanitation provision lags behind access to water-and there is no evidence that this gap is narrowing (UNDP, 2006). The challenge now is to provide the worlds population especially the poor with adequate sanitation facilities. Ujang and Henze, (2006) note that despite the billions of dollars of investment spent every year, billions of people are still suffering and dying of poor sanitation.

The problem of access to sanitation is further acerbated by additional challenge of increasing population and urbanization. There are more and more people leaving in urban areas and the trends are increasing. The proportion of the world's population living in large towns or cities has grown from around 5% to 50% over the past two centuries. Demographers estimate that by the year 2030, two-thirds of the world's population will leave in large towns or cities (McMichael, 2000). This highlights the impending challenge posed to sanitation services which they are neglected.

The need to realize that sanitation is half water services cannot be overemphasized; Sanitation has been the forgotten "orphan child" and will remain so if our focus is not shifted. People are more willing to pay for water than they are for sanitation and hygiene promotion; however, the health benefits of water supply can only be maximized where all the three services are provided (Mwanza, 2001)

The water cycle cannot be completed if the sanitation services are neglected. Integrated Water Services Management² (IWRM), with the concept of sustainability will remain a dream if the debate and/or concerns of water and sanitation services remain skewed to water provision and sanitation remains implicitly but not explicitly discussed. It is interesting to note that even with the neglect of the sanitation sector, we cannot avoid. "It does not matter how far one urinates; the last drop will always land on his/her footstep". Any plan to provide water for domestic use, if it does not ensure that households also have adequate means to dispose off wastewater, can endanger health rather than improve it (Cairncross, 1992). In most cases the untreated sewage discharged in water bodies, always ends up in water courses which, also serve as our drinking water sources. The resultant polluted water sources notwithstanding, mismanaged sanitation always metamorphose into increased costs for water treatment and medical costs. In most cases, with the emphasis on water, water infrastructure is expanded and more water is availed to people and this water eventually turns into sewage. The development trends in sanitation do not commensurate those of water provision, yet water and sanitations are "cousins"

It is worth noting that there have been substantial improvements in infrastructural development for sanitation. Also the international community has made a major shift towards sanitation provision; this can be affirmed in the development of MDG for sanitation and the achievements therein. The development of alternative technologies to address sanitation problems in development countries has also been on the increase. The principal challenge for the next decade will not be technological questions-the "hardware" of water supply and sanitation-but the "software" issues: How are the water

² IWRM is the process which promotes the co-ordinated development and management of water, land and other related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of the vital ecosystem Global Water Partnership, (2000).

and sanitation programmes to be organized and financed? How can people be trained, organized and motivated to install, use and maintain the facilities? How can institutions develop the sector further and make improvements more sustainable? (Cairncross, 1992).

1.2 Problem Statement

The international community is now placing emphasis on sanitation as can be seen from the formulation of the MDG for sanitation, which is to halve the number of people without adequate sanitation in 1990 by the end of 2015. Notwithstanding the emphasis given to sanitation, little research has been done to address the knowledge gap on institutional arrangements and management of sanitation services.

1.2.1 What has been looked at?

From literature reviewed, the studies outlined below illustrate what has been looked at regarding wastewater services provision especially in the water supply and sanitation sector.

- I. A study to make a first attempt at better understanding the institutional arrangements for wastewater and sanitation in municipal areas by mapping the actual situation whilst looking at five issues. First, which are the parties providing wastewater and sanitation services. Second what services is each of these parties providing, to whom and on what contractual and financial basis? Third, under which management mode are the different parties operating. Fourth, what, if any is the cost recovery arrangement? And finally, what are the linkages between the different parties (Blokland *et al.*, 2006).
- II. Sanitation and Water Supply: Practical Lessons from the Decade a discussion paper, which provided the author with experience during the International Drinking Water Supply and Sanitation Decade's ten-year effort to provide low-cost waste disposal facilities to poor communities in developing countries (Cairncross, 1992). In his experiences, he raised questions like: How are the water and sanitation programmes to be organized and financed? How can people be trained, organized and motivated to install, use and maintain the facilities? How can institutions develop the sector further and make improvements more sustainable?
- III. "Characteristics of Well Performing Public Water Utilities" (Baiette *et al.*, 2006), a report which presented findings on attributes of well-run public utilities, identifying important factors that influence their performance. This report although it highlighted factors contributing to performance of water utilities, it said a little on sanitations services.
- IV. An assessment of bureaucratic and new public management models in water supply and sanitation sectors in low and middle-income countries (Schwartz, 2006), a study which examined the potential of reforms associated with the New Public Management in contrast with reforms associated with the bureaucratic model of public administration.

- V. A study by Mara et al (2007) on sanitation selection algorithm, which considers all the available sanitation arrangements, including ecological sanitation and low-cost sewerage, and which is firmly based on the principles of sustainable sanitation, is developed as a guide to identify the most appropriate arrangement in any given situation, especially in poor and very poor rural and peri-urban areas in developing countries
- VI. Allison (200) carried out a study to establish the extent there is a shared responsibility between local governments and community based organizations towards sanitation provision. In the study, it was found out that institutional and technical capacity, political will and cultural diversity will impact on the balance between rights and responsibilities.

1.2.2 What has not been looked at?

Studies highlighted in section 1.2.1 looked at institutional arrangements for wastewater services. The studies have attempted to find factors that contribute to well performing water utilities, and raised a lot of questions on how water and sanitation programmes should be organized and financed, how can people be trained, organized and motivated to install, use and maintain the facilities among other issues. The studies show what to consider when selecting sanitation arrangement for given community setups. The studies did not give emphasis on factors that influence wastewater services provision by utilities. Close scrutiny of the studies that tended to look for factors affecting performance of water utilities were asymmetrical tending to look at only water supply. The outcome of these studies generalized the factors contributing to good performance for water utilities to also apply to wastewater services provision.

1.3 Objectives

As mentioned earlier, there is attention being given to sanitation services presently. There are some considerable studies on appropriate technologies for handling wastewater. The research objective is to address the knowledge gap in institutional arrangement and management of sanitation services by undertaking a comparative analysis of different cases. I am interested in discovering how sanitation is organized and what makes it to work or not. The purpose of the study is to get a better understanding of the factors that contribute to performance by utilities with respect to wastewater services hence the research falls under the category of applied research and the findings can be used in reforms of utilities providing wastewater services.

1.3.1 Other Objectives

- 1) To carryout and institutional assessment to determine the level of performance respect to wastewater services.
- 2) To determine the factors that contribute to good performance of utilities and/or agencies providing water and wastewater services.
- 3) To establish the possible link between the level of performance of the selected cases with the theoretical factors that contribute to performance

1.4 Propositions

Utilities providing wastewater services are more likely to be effective if they have higher levels of following conditions. The below propositions have been developed from (Rainey and Steinbauer, 1999) “Galloping Elephants: Developing Elements of a Theory of Effective Government Organizations” and (Baiette et al., 2006) “Characteristics of Well performing Water Utilities.

- 1) Interaction with external institutions,
- 2) Autonomy in operationalization and pursuit of utilities mission,
- 3) Strong organization culture linked to the mission, Utilities with high organization culture, linked to mission will achieve high level of effectiveness with respect to sanitation services
- 4) Leadership, the more effective the leader of the agency, the more effective the agency
- 5) Customer orientation,
- 6) Commercial orientation,
- 7) Development of human resources “Effective institutions develop and maintain their personnel”
- 8) Internal accountability, where accountability within the utility is enhanced, is a key ingredient for improving performance.
- 9) External accountability and,
- 10) Technical capacity of the utility.

Utilities that direct their efforts towards the above conditions will provide better wastewater services.

1.5 Research Questions

- 1) What are the critical factors that contribute to performance³ by utilities with respect to wastewater services provision? Or what factors influence a utility’s performance with respect to wastewater services provision.
- 2) What is the current performance of the utilities considered for this study?
- 3) What factors have contributed to the current status of performance?
- 4) How does the level of each factor relate to the level of performance?

1.6 Summary of the Chapters

1.6.1 Literature Review

Chapter two presents the literature that was found on the topic. The literature looks at the management modes available for provision of sanitation services, the different technologies for sanitation provision, financing arrangements, human resources competences in wastewater services provision. The chapter also looks at characteristics of well performing companies and/or utilities providing water and wastewater services. It forms the basis of the analytical framework that was used to analyze the cases.

³ The aspects of performance considered in this respect include effectiveness, quality, accountability and system coherence. The focus is not on measurements of financial ratios like return on investments, technical efficiency or productivity.

1.6.2 Methods

This chapter shows the tools and methods used for data collections and analysis. It reports on the information sources used as well as the applied methods and instruments for data collections and data analysis. The chapter shows the cases studied and describes the circumstances and the problems encountered. The research involved a case study approach focusing of three cases of National Water and Sewerage Corporation, Uganda, LYDEC (Casablanca, Morocco), and Johannesburg Water, South Africa. The tools for data collection included collection of further literature, documentary review, interviews and surveys. Analysis of the data followed the analytical framework and surveys were subject to statistical analysis where the mean and the standard deviation of a given indicator were computed.

1.6.3 Data and Findings

Chapter four shows the data from the field, analysis and findings. The analysis was carried inline with the methods explained in chapter three. The chapter shows the performance of each of the cases and finds factors that explain the level of performance. In chapter, the researcher tries to be objective and comprehensive as possible and avoids subjective interpretations and discussions.

1.6.4 Discussions

Chapter five link the findings in chapter four with those of other studies and the theoretical concepts. The findings are discussed in light of the objective for the study and the research questions developed in chapter one. The chapter also tries to discuss how the findings might have been affected by the methods of study used.

1.6.5 Conclusions and Recommendations

In chapter six, the results from the findings emanating from data analysis are compared with the propositions formulated in section 1.4 and some generalizations are made regarding performance of utilities with emphasis on wastewater services. This chapter basically touches the objective of the study and the research questions. The chapter makes recommendation on improvement of wastewater service provision by utilities. It also gives a hint on areas for further research and investigations.

2 Literature Review

2.1 Overview

This section briefly describes the literature that was found on the topic. It delves into the management structures available for provision of sanitation services, the different technologies for sanitation provision, financing arrangements, human resources competences in sanitation and characteristics of well performing companies. Literature review formed the basis of the analytical framework that was used to analyze the cases. The literature was obtained from journals, books, published papers by different researchers and websites.

2.2 Conventional approach to sanitation services

2.2.1 Public management

Under public management it is the public sector that owns the assets and operates the services. Thynne, (1998) categorizes government companies according to their legal foundation, status as a legal entity and basis of ownership. These can be a ministry department, a statutory body, a trust and a company. According to him, NWSC would be termed as a statutory body whereby it is formed by a statute and is nationally owned by the government. Accordingly Lusaka Water and Sewerage Company would be termed as a company founded by the memorandum of articles of association, owned by the government where materials and assets owned by the company. The major difference lies in the legal framework under which these organizations operate. Whereas a government owned company operates under private law, statutory bodies operate under public law. This will determine how an organization operates, the degree to which is controlled and called to account (Thynne, 1998).

2.2.2 Financing (government subsidies)

Thynne, (1994b) suggests four ways of financing of companies and other organizations for good or service they provide:

- 1) Free of charge, with all the costs involved being borne by government and being allocated by way of;
 - a) direct appropriations to providers within government,
 - b) subsidies, grants or the like to providers within and/or beyond government,
 - c) vouchers to users or consumers to exchange with providers within and/or beyond government, or
 - d) some combination of (a), (b) and/or (c);

- 2) At a price (which could be regulated), with some of the costs involved being borne by government (in accordance with one or more of (a) to (d) immediately above) and some being borne by users or consumers through the payment of fees or charges; or
- 3) At a price (which could also be regulated), with all of the costs involved being borne by users or consumers through the payment of fees or charges.

In developing and semi-developed nations, financing of water and sanitation category 1 and 3 are not common. In most cases financing of a conventional approach to sanitation provision will be at a price where some of the costs are being born by the government through subsidies, grants to providers and some being borne by the users through payment of fees and/or charges.

2.2.3 Conventional Sewerage

Provision of wastewater and sanitation services can be distinguished according to the distinct processes. The processes are collection of the wastewater, transportation to the point of treatment, treatment and disposal of the treated waste (Blokland et al., 2006). For municipal areas, the most typical method is the traditional wastewater approach “end-of-pipe” and centralized treatment technologies with river discharge of effluent.

2.2.4 Limitation of the Conventional Approach for Developing Countries

This method focuses on solving short-term problems instead of avoiding them by using appropriate approaches (Nhapi.I, 2004). According to Nhapi (2004), it results in unrestricted usage of water, fossil nutrients and energy hence suppressing the development of systems with source control. Although he argues the conventional methods results into unrestricted usage of water he does not tell us about the use of water tariffs to reduce wastages. Calling for appropriate approaches without highlighting on them is not sufficient.

The other problems associated with conventional approach to sanitation are funding. At the moment many developing countries are adopting the “conventional sanitation” approach to replicate the developed countries without taking into consideration the funding availability (Ujang and Henze, 2006). They call for a better understanding of the nature of the environment and health problems and the characteristics of the various pollutants before adopting a given technology. Nonetheless, there might not be a better technology to handle municipal wastewater that end-of-pipe approach. Some of the suggested ecological sanitation systems are not appropriate for cities.

Average construction costs of sanitation technologies are given in table 6.1. It is worth noting that costs are site specific and these should be treated consciously (Paterson et al., 2007).

Table 2.1 Relative Cost of different technologies

| | Construction cost (us\$)⁴ |
|--------------------|---|
| Simple pit latrine | 26-60 |

⁴ Average cost for Africa, Latin America and the Caribbean, Paterson (2007) cited 1990-2000 (WHO and UNICEF, 2000).

| | |
|-----------------------|---------|
| VIP latrine | 50-57 |
| Pour-flush toilets | 50-90 |
| Conventional Sewerage | 120-160 |
| Simplified sewerage | 52-112 |

The above highlights the problem of conventional sewers for providing sanitation to the peri-urban residents. The cost for construction let alone maintaining the conventional sewers are more than twice the cost of other technologies.

The current situation in water and sanitation services for million of peri-urban residents is starkly anti-poor and represents a major challenge of the 21st century (Paterson et al., 2007). Paterson (2007) argues that the conventional sewerage is an implicitly anti-poor technology and advocates for a simplified pro-poor sewerage that is technically feasible and economically appropriate for low income, high-density urban areas. Some of the on-site sanitation technologies advanced includes simple pit latrines, VIP latrines and pour-flush toilets. A simplified sewerage⁵ system is also advocated for in peri-urban areas. The same cannot be said for cities where the conventional systems are prevalent but have been poorly managed. The simplified systems can work in peri-urban areas but the question is who finances the construction of these systems since households might already posse poor but cheap means of wastewater disposal. What institutions are available to manage these simplified sewerage systems. Nonetheless, availability of simplified sewerage system might be one of the success factors in provision of sanitation services.

2.3 Alternative approaches to sanitation services

2.3.1 Management Models

Partnerships: It is some form of mixed management which includes public-private and public-public management. It offers a range of options where ownership, management and associated risks are shared between the public and private sector. Public-private management may be inform of service contracts, management contracts, affermage, lease, concessions and BOT, BOOT, BOO type of contracts. Some the options suggested under Public-Private partnership-BOT, BOOT,BOO, Inverse BOOT- can only be applicable for treatment works and not sewerage networks. Basically we can say that partnership in water supply and sanitation has been service contracts, management contracts, lease and concessions.

Private Management: Private management signifies that both the ownership and the management of assets are in private hands. The existence of divestures for conventional sewerage systems is questionable since in most cases the business is considered to be unprofitable. However, they exist for small scale independent providers. These private operators fill in the gaps where formal utility fail to offer the service. The so-called privatization have, in practice resulted into a mix of public and private arrangements as highlighted by (Thynne, 1998). The water and sanitation sector has been the least

⁵ Simplified sewerage is a network of pipes that take domestic sewage away to be treated or disposed off else where; the conservative design codes are relaxed in order to reduce the pipe diameters, gradients and depth. The wastewater per household assumed in design can be reduced where it is evident that the households have limited supply.

attractive to private investment. The percentage of the world's population currently estimated to be served by the private sector is still around 5% (Budds et al., 2003). Proponents of service provision by the private sector rather than the public sector argue that the former are more efficient than the latter. There is no empirical evidence that private firms will out perform public ones in water and sanitation provision (Renzetti and Dupont, 2004).

2.3.2 Financing

The major reason of involvement of private participation is make utilities financially viable. Various cost recovery mechanism are being applied to cover at least operational costs of wastewater treatment and some capital investment (UNEP/WHO/HABITAT/WSSCC, 2004). These include direct charges and fees to user or pollution fees such as effluent charges and discharge permits. However, the question is what is the practice in related to the theoretical instruments listed below? Do we have institutions in place to implement the suggested measures for cost recovery?

Table 2.2 Cost Recovery Instruments

| Type of Instrument | Description |
|--------------------------------|---|
| Consumption-based user charges | User charges are levied upon discharge of wastewater into a sewerage based on volume and/or characteristics of effluent. The volume of discharged wastewater is directly related to the water consumed. Tariff is collected as a surcharge on the water consumption bill. |
| Effluent charges | Effluent charges can be based on actual wastewater quantity and quality, on a fixed amount per HH, or, with regard to industry, on a proxy based on verifiable information about the industry (production, number of employees, etc) |
| Discharge permits | A responsible authority sets maximum limits on total allowable emissions of a pollutant to a sewer or to surface water. In discharge permits, charges or levies can be incorporated for cost recovery purposes. The system requires monitoring of effluent flows and quality. |
| Tradable effluent permits | Can give pollutants more flexibility in investment and operation of wastewater management. |
| Subsidies | These can be in form of subsidies for providing environmentally sound re-use services/technologies and assisting disadvantaged groups in society. However, they should be implemented with great care to avoid the negative effects e.g. unwilling to pay for the real price for the service. |

The most applied method is consumption-based User charges levied upon discharge of wastewater into a sewerage based on volume and/or characteristics of effluent. The volume of discharged wastewater is directly related to the water consumed. Effluent charges may be applied if dumping is done directly at the treatment plant. Subsidies and tradable effluent are not very common and are a bit theoretical for developing countries.

2.3.3 Appropriate technologies

Simplified sewerage: According to Paterson (2007), simplified sewerage is even cheaper than some on-site sanitation system and the system has been tested in Brazil, Colombia, Peru and Bolivia. According to Paterson, et al., (2007), simplified sewerage systems can be relatively cheaper than even other systems like VIP latrines, pour-flush toilets. These system may be better for peri-urban set ups but may not be best alternatives for heavily populated cities.

Ecological Sanitation: Langergraber and Muelleger (2005), argue that conventional sanitation concepts based on flush toilets, a water wasting technology, are neither ecological nor economical solution for developing countries. They call for a sanitation system that provides Ecological Sanitation (EcoSan⁶) and emphasize that ecological sanitation is an alternative approach to avoid the disadvantages of conventional wastewater systems. In theory this is true but application of EcoSan has been met with a lot of resistance because of cultural, religious and social factors. The assertion that EcoSan can replace conventional systems is far too fetched for cities. However, it can be one of the success factors to consider for peri-urban areas. Also adaptation to appropriate technologies may be factor for better sanitation provision.

Other appropriate technologies available include household toilets, household latrines (ordinary pit latrines and VIP), septic tanks and communal facilities.

In conclusion, Nyapi (2004), highlights that change in economics patterns has led to urbanization resulting into increased pressures on urban infrastructure and resources hence most cities failing to cope with services provision. He calls for a drastic review of the current pollution prevention approaches in terms of strategies and technologies, regulatory frameworks, affordability and institutional settings. A pollution prevention policy and institutions to implement the policy is likely to lead to better sanitation.

2.4 Characteristics of Well Performing Utilities

Determining success factors for sanitation provision by utilities has been based on literature found on institutional assessment procedures and organizational performance.

2.4.1 Leadership

“The more effective the leader of the agency, the more effective the agency”. Scholars regularly cite leadership as an essential element in the success of public agencies (Rainey and Steinbauer, 1999). It is the ability to inspire other to understand the institution’s mission, to commit themselves to the mission and to work towards its fulfilment (Cullivan et al., 1988). They provide motivation for managers and staff to perform their functions in all situations. The effectiveness of leaders might depend on the period served and both internal and external environment. The question that arises here is how leadership has influenced the level of wastewater service provision by utilities.

⁶ EcoSan is a closed-loop system with the underlying aim of closing nutrient and water cycles where human excreta are treated as a resource and usually processed on site and then treated off-site. The nutrients contained therein are then recycled by using them in agriculture.

2.4.2 Capacity

Financial: National budgets for sanitation provision are currently limited to around 20% of national investments in water and sanitation sector [WHO/UNICEF, 2000]. Money allocated to sanitation services provision will translate retrospectively into success of the sector. These finances as required to improve the existing systems and subsidize new technologies etc. Allocation of funds to the wastewater management will be mirrored into the performance on the sectors. What is the current level of cost recovery for sanitation services provision?

Human resources: The categories of manpower may be distinguished at organizational level for sanitation services sub-sector. According to the Human Resources Development, Carefoot, N & Gibson, H (1984), they suggested the following breakdown in accordance with different categories for management, operation and maintenance of urban sewage treatment plants. This categorization of manpower might be useful in conventional sewer system, but might not work for a simplified sewer system and EcoSan. The dilemma is what institutions are available to manage the other systems like the simplified sewerage systems? Can the same arrangements be adopted for the simpler systems?

Table 2.3 Categorization of manpower for urban sewer systems

| # | Job Category | % of Total |
|---|--|------------|
| 1 | Management / Professional | 5 |
| 2 | Technical/Administrative (senior level) | 10 |
| 3 | Technical/Administrative/Clerical (Junior level) | 25 |
| 4 | Craftsmen | 10 |
| 5 | Operators | 50 |
| | Total | 100 |

Technical Capability: This is the measure of the institutions competence's in conduction the technical work required to carry out the responsibilities of the institution. Most of this technical work is performed by directly by skilled, qualified employees, but specialists whose work is supervised by the institution's staff may be used where appropriate (Cullivan et al., 1988).

2.4.3 Autonomy

Organizational autonomy is a degree to which an institution is able to ,make and carry out a series of decision which profoundly affect performance in most areas (staff hiring, setting tariffs, budget development and control, planning and investment among others) (Cullivan et al., 1988). Autonomy has various dimensions, managerial autonomy, policy autonomy, financial autonomy, legal autonomy, and interventional autonomy (Verhoest et al., 2004). Dispensation of autonomy is one of the key success factors to determine performance of utilities. Although this is a consensus view, there is considerable debate regarding the power of the autonomy-performance relationship (Braadbaart et al., 2007). What is the adequate level of autonomy to achieve optimum performance? Level autonomy will range from minimum to maximum with low and high as intermediates

depending on the different dimension of autonomy one is assessing. Can we attribute performance of organization providing wastewater services to the degree of autonomy?

2.4.4 Government support

Lack of funds may explain the lack of attention to sanitation in many cities (Sundar et al., 2003). Sundar notes that this is not the case for cities such as Mumbai and Pune. He highlights that it is a political choice regarding what infrastructure to prioritize and what to ignore that explains the inadequacies in provision. The same can be said of many cities in developing countries in Africa and the cases of Mumbai and Pune in India are not a stand alone. Politics plays a big role in allocation of resources and might be one of the major success factors in the provision of better sanitation services. The question is when and how do politicians develop sensitivity to issues of sanitation? The case of Bombay, the government thought financial assistance to improve sanitation after cholera outbreak in the city which threatened the business since the city served as a major port. How are the government supported utilities in providing better wastewater services?

2.4.5 Commercial Orientation

This is the degree to which actions in the institution are driven by cost effectiveness and operating efficiency (Cullivan et al., 1988). According to them, performance of institution's functions should be guided and disciplined by a strategy to achieve financial self sufficiency at an appropriate stage of growth. This is not achievable for even water institutions however working towards it is a positive for performance. On the contrary working towards commercial orientation as highlighted above might inhibit sanitation provision, the investment required to install system has an initial high cost. This is likely to transform into very high tariffs for wastewater services provision. However, actions like operating efficiency and reduction of cost within a utility might signal good performance.

2.4.6 Consumer Orientation

This is the extent to which utilities listen to clients, work to meet their needs, solicit their views regarding standards and level of service, or answer promptly to their complaints (Baiette et al., 2006). All work, programmes, all innovations are directed towards greater efficiency, effectiveness, and equity in service to the customer (Cullivan et al., 1988). Customer orientation is strong factor since all efforts are directed towards serving the customer. Technical problems will inevitably be solved to satisfy the demands of the customer to improve service standards.

2.4.7 Corporate culture

Organization culture is the set of values and norms which inform and guide everyday actions (Cullivan et al., 1988). It involves moral, social, and behavioural norms that inspire staff and managers to excel. Corporate culture is established through clear mission statements and performance objectives for service quality and coverage. It shapes the beliefs and core values, attitudes, and ability of the staff to set priorities to achieve their mission (Baiette et al., 2006). The higher the mission valance of the government agency the more effectively the agency will perform (Rainey and Steinbauer, 1999). According to them, the mission of an agency can be attractive or abhorrent to individuals. This will determine the support of the mission from individual and the eventual effectiveness of the agency.

2.4.8 Development of human resources

Effective institutions develop and maintain their personnel. Development and maintaining staff include those activities directed towards recruiting staff, providing skills to do the jobs and grow professionally, and providing adequate job satisfaction and wages and benefits to retain competent staff (Cullivan et al., 1988). The questions which arise here is what are the formal training programmes and informal training that are directed toward sanitation provision. According to Rainey and Steinbauer, (1999), development of human resources relates to the agency effectiveness and they attribute agency effectiveness to professionalism among the members.

2.4.9 External accountability

External stakeholders fulfil a number of important functions in the planning and operation of a utility. These include (a) policy making, which guides the management of the utility, its service delivery objectives, and quality standards; (b) ownership, which sets performance targets and financial objectives to maximize the value and efficiency of the assets; (c) regulation or authority to monitor compliance with the legal and contractual obligations and service standards placed upon operators, determining tariff levels, and resolving conflict between regulated companies and their customers; (d) demand for service or entitlement to receive services provided by the utility that are commensurate with tariffs paid and acceptable quality; and (e) financing or authority to secure financing in both debt and equity (Baïette et al., 2006). According to them, this implies multiple accountabilities to the various external stakeholders, which may include central and local governments, customers, donors, and financial institutions all pulling utility in a specific direction based on their underlying interests, in both transparent and non-transparent ways. Effectively, this poses a big impact of the success of sanitation provision.

2.4.10 Internal accountability of results

Internal accountability looks at how management and staff are held accountable for effectiveness (the degree to which the utility realizes its goals) and efficiency (the cost effectiveness of resources used to produce its water services). Baïette, A., et al, (2006) asserts that where accountability and autonomy within the utility are enhanced, this is often seen as a key ingredient for improving performance. Indicators highlighting internal accountability in a utility include responsiveness of the chief executive to the board; whether performance targets are well defined and provide incentives, sanctions, or both; whether staff are subject to annual performance evaluations; whether they are also subject to incentives for achieving performance targets; and whether staff are trained to perform well. The assessment of this factor would establish the performance targets for wastewater services at all levels of management.

2.4.11 Interaction with key external institutions

Many entities in the external environment affect performance of wastewater services. These may be political (parent ministry and legislative bodies), financial (lending sources, donors, and budget/finance ministry), and regulatory entities which have influence over operations (Cullivan et al., 1988). An effective organization has the ability to influence and adapt to these external entities to achieve its goals. These external institutions which include donors and government provide the necessary finances and political environment to the utility to execute its obligations.

3 Methodology

3.1 General

The research followed a conceptual framework that was developed from review of literature. The tools for data collection included literature and documentary review, surveys and in-depth interviews with key informants and observations. Quantitative data was obtained from primary and secondary sources and this was used to analyze the performance of utilities with respect wastewater services. To verify the factors influencing wastewater services provision, in the conceptual framework, a combination of documentary reviews, surveys, in-depth interviews and observations were used.

3.2 Desk Study

The desk study was conducted mainly at IHE during the month of September and 2007. The desk study included literature review and making preparation for the field study.

3.2.1 Review of Literature

A critical review of related literature was carried out. The literature provided the theory and deeper understanding of the research problem and enabled the researcher to formulate the conceptual framework onto which the research is based. The conceptual framework for the research was prepared as a way of focusing the research and paving a way for data collection. A schematic of the conceptual framework is shown in figure 3.1. The conceptual framework enabled the researcher to develop an analytical framework for data collection and analysis of the cases. A copy of the analytical framework is shown in appendix 1.

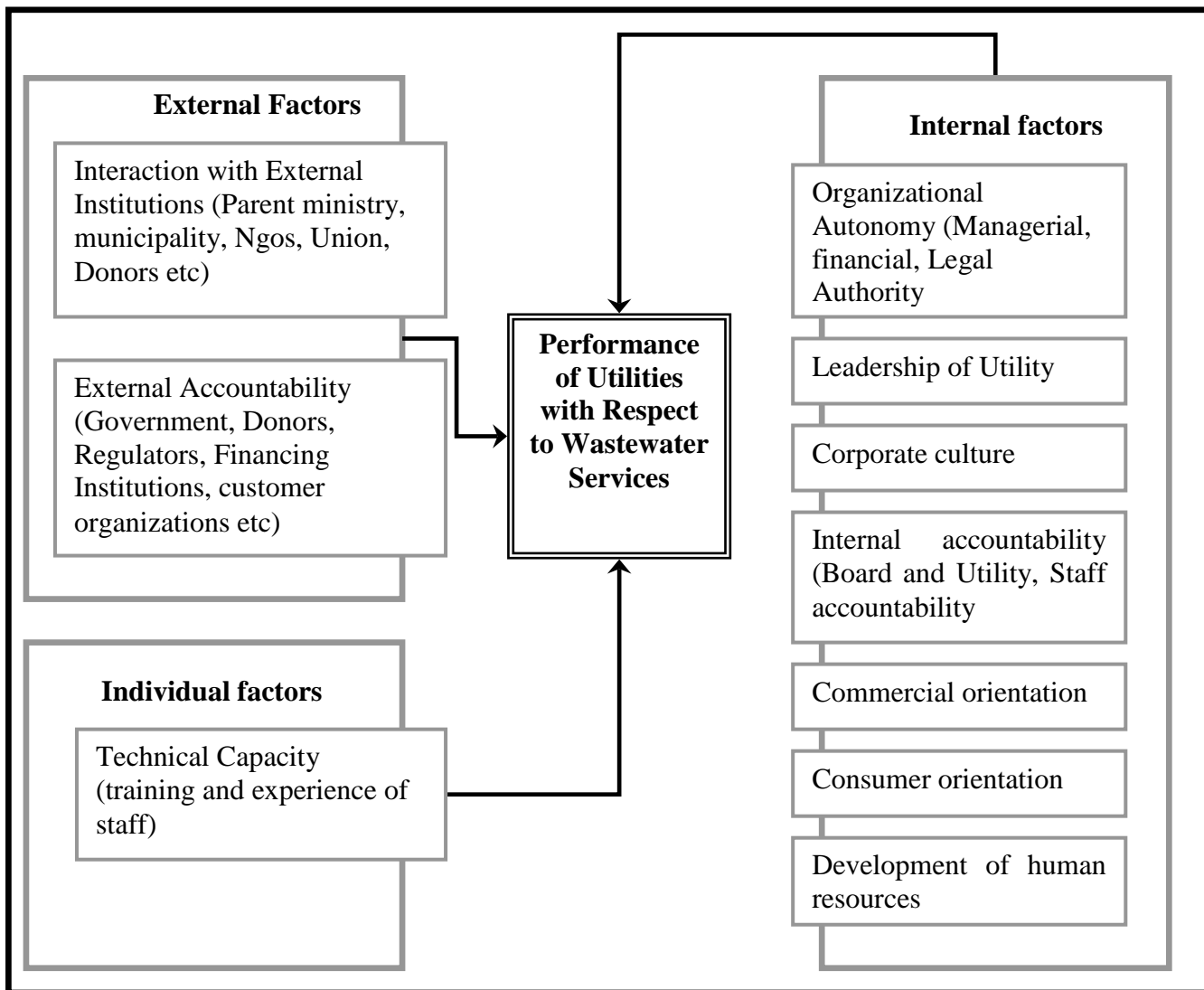


Figure 3-1 Conceptual Frame work for the research

3.2.2 Required Data

The stage of developing an analytical framework from the conceptual framework led to the step of determining what kind of data would be required, identifying sources and the key informants. Table 3.1 shows the data need, where and how the data was obtained. Also a complete set of analytical framework which guided the study is in appendix 1.

Table 3.1 Data Matrix for data collection during field work

| SNo. | Proposition | Data Needed | Where to Obtain data | How to obtain data |
|------|--|---|-------------------------------------|--|
| 1 | Organizational Autonomy (Managerial, financial, Legal Authority) | Decision making authorities on budgets, procumbent, standards, institutional setups | Utility managers, water acts review | Review, desk study, interviews with managers |
| 2 | Leadership of Utility | Missions, performance standards, inspirations | Corporate plans, | Review, interviews and surveys to get |

| SNo. | Proposition | Data Needed | Where to Obtain data | How to obtain data |
|-------------|--|---|--|--|
| | | | managers & staff | opinions. |
| 3 | Corporate culture | History of the utility, staff turnover, functions of the utility | Corporate plans, managers & staff | Review, interviews and surveys to get opinions, observations |
| 4 | Internal accountability (Board and Utility, Staff accountability) | Performance standards for managers & staff, Rewards & penalty formulas, | Annual reports, contracts | Review, interviews with managers, observations |
| 5 | Commercial orientation | Cost effectiveness, operating efficiency & reduction of losses | Reports, commercial managers | Reviews, interviews with managers |
| 6 | Consumer orientation | Financing of wastewater services, Instruments to establish customers opinions | Reports, commercial managers | Reviews, interviews with managers |
| 7 | Development of human resources | Staff hiring, promotion, salaries and incentives, skills transfer & training | Human resources manuals, interviews | Interviews with human resources managers, reviews. |
| 8 | Interaction with External Institutions (Parent ministry, municipality, Ngos, Union, Donors etc) | Financial support, working relationship, Influence | Managers of ministry departments, reform managers, Unionists | Reviews, interviews with managers |
| 9 | External Accountability (Government, Donors, Regulators, Financing Institutions, customer organizations etc) | Rewards, performance bonuses, penalties, contractual obligations | Managers of ministry departments, reform managers, | Reviews, interviews with managers |
| 10 | Technical Capacity (training and experience of staff) | Experience and qualification of staff, Executed projects, Research on wastewater, Equipment and resources | Utility managers, reports | Interviews with human resources managers, staff, reviews. |

3.3 Field Study

The field study was mainly for data collection in Uganda (National Water and Sewerage Corporation). In Uganda, data was obtained by conducting a survey (survey sheet is appended in appendix 2), and the use of in-depth interviews with the managing director, chief managers, human resources, finance and sewerage services managers and project planners from the NWSC. Also the Environment officer for National Environment Management Authority and (NEMA) and the Assistant Commissioner for the Directorate Water Resources Management were interviewed. In-depth interviews were aimed at seeking clarification on issues that were not clear from the survey s, review of documents and reports. This also assisted to subdue bias which would have otherwise emanated given the sensitivity of the topic. A complete list of people interviewed is in appendix iii.

3.3.1 Introduction of the Research Topic to NWSC

The research was introduced to the Manager External Services and Research of NWSC, Dr. Rose Kaggwa. A copy of the proposal was handed to her and she assigned to me a co-mentor Mr. Sonko Kiwanuka, who would assist in approaching different key informants. The topic was also introduced to the Chief Manager Institutional Development and External Services and the Managing Directors. Discussions with the above stakeholder welcomed the topic and promised assistance whenever possible. The managing director and in his own words I quote “thank you for selecting the topic, highlight the grey areas as this will go along away in improving the performance of NWSC” I was advised that since my study was comparative study of utilities i.e. NWSC, Casablanca and Johannesburg Water, I develop some benchmark, which would signify good performance. It is upon categorizing a good performer and/or bad performers that I would go ahead and establish the factor leading to a given performance.

3.3.2 Documentary Review

Documentary review was carried out to verify the data obtained. This included annual audited reports, Water and sanitation sector performance reports and quality reports to verify performance. Other document reviewed included the Water Act and the NWSC Act. To verify some of the quantitative data, primary data was obtained where possible. The list of documents reviewed has been appended in appendix IV.

3.3.3 Surveys

A survey was conducted to verify and get staff opinion on some key indicators on a given factor. A set of questionnaire is in appendix 2. The survey was conducted among selected staff that work in the sewerage services section and area managers. I included in the survey the staff of NWSC at management level those that interact with wastewater service provision. This was to avoid staff that had not interest or little knowledge on the subject.

Table 3.2 Background of respondents

| Characteristics | Population | Respondents | Respondent % |
|---|------------|-------------|--------------|
| Area managers where there is sewerage services | 12 | 8 | 66.7 |
| Branch Managers in Kampala, where there is sewerage network | 4 | 3 | 75 |
| Sewerage Engineers and Superintendents of works for Kampala Area | 7 | 7 | 100 |
| Staff who have knowledge and have worked in the sewerage department | 4 | 4 | 100 |
| Commercial officers | 3 | 2 | 66.7 |
| Project Managers | 2 | 2 | 100 |

Collection of Data from Johannesburg Water

My mentor made initial contacts with Prof. Labre of SUEZ Company, a company with a management contract with Johannesburg Water. The telephone contacts and email address of the interviewees were obtained. I introduced myself to the respective respondent through an introductory letter, where I attached the list of questions I intended to ask. This was intended to give the interviews and insight into the questions and to allow them prepare appropriately. In the mail I proposed the time for the interviews giving them a week to prepare and choose their most appropriate dates. Interviews with the respondents from Johannesburg Water were conducted on phone at the agreed date.

3.4 Data Analysis

3.4.1 Analytical Framework

An analytical framework was developed prior to the study; it guided the research in data collection and analysis. The propositions in the conceptual framework were operationalized and the cases in this research were analyzed as per the framework.

3.4.2 Surveys

Data from surveys were subject to statistical analysis where the mean and the standard deviation of a given indicator were computed. Respondents were asked to respond to items on a five-point scale, representing strong agreement (1) to strong agreement (5). Consequently a “3” represented indifference, that is, neither agreement nor disagreement. Some indicators had an option ranging from strongly disagree to strongly agree. Some indicators were ranked from very low to very high with intermediates, again options were ranked on a five-point scale where the least score would be assigned 1 and the highest assigned 5. For each indicator, the mean and the standard deviation were computed. The summation of the means divided by the number of indicators for the given factor gave index of that factor on a 0 to 1 scale.

For the indicators, which had less than five options, the score would be divided by the number of options available. This allowed standardization of the indicators and they would be easily added. Computation of the standard deviation was done to measure the spread of the scores around the mean. A very low standard deviation signalled that the

opinions of the respondents were very close to the mean. A very high one acted as a call to check the data input.

3.5 Challenges

1. Conducting Interviews on phone is not quite and easy exercise. It is tiresome to both the interviewer and the interviewee.
2. Interviews were conducted with respondent who did not have a good command of English language. Respondents from Johannesburg Water were French speaking and did not find it easy to communicate in English. This would sometimes require a third party to interpret what both the interviewer and interviewee meant.
3. It was not possible to visit Johannesburg water because of funds and the time as such I rely on phone interviews missing out on the interpersonal contacts.
4. Not quite easy to obtain some data because of the nature of the research.

3.6 Brief Description of the Cases

- The NWSC is a government parastatal charged with the provision of water and sanitation services in major town of Uganda, on a commercial viable basis. It was established in 1972, and given the mandate of operating and providing water and sewerage services in areas entrusted to it on a sound, commercial and viable basis.
- Casablanca in Morocco - A multi-services company offering water, and electricity distribution, Sanitation management, Street lighting management also a private company (SUEZ)
- Johannesburg Water (Pty) in South Africa- established in 2001 as a municipal entity to provide water and sanitation services to approximately 3.2 million people. A government owned company with a management contract with SUEZ.

3.7 Why the above Cases?

The above cases offered different institutional set up for the provision of sanitation services. NWSC is a governmental parastatal with Internally Delegated Management Contracts (IDAMC), Casablanca-Morocco is a concession with private sector involvement, and Johannesburg Water (Pty) is a government owned company with a Management Contract with SUEZ.

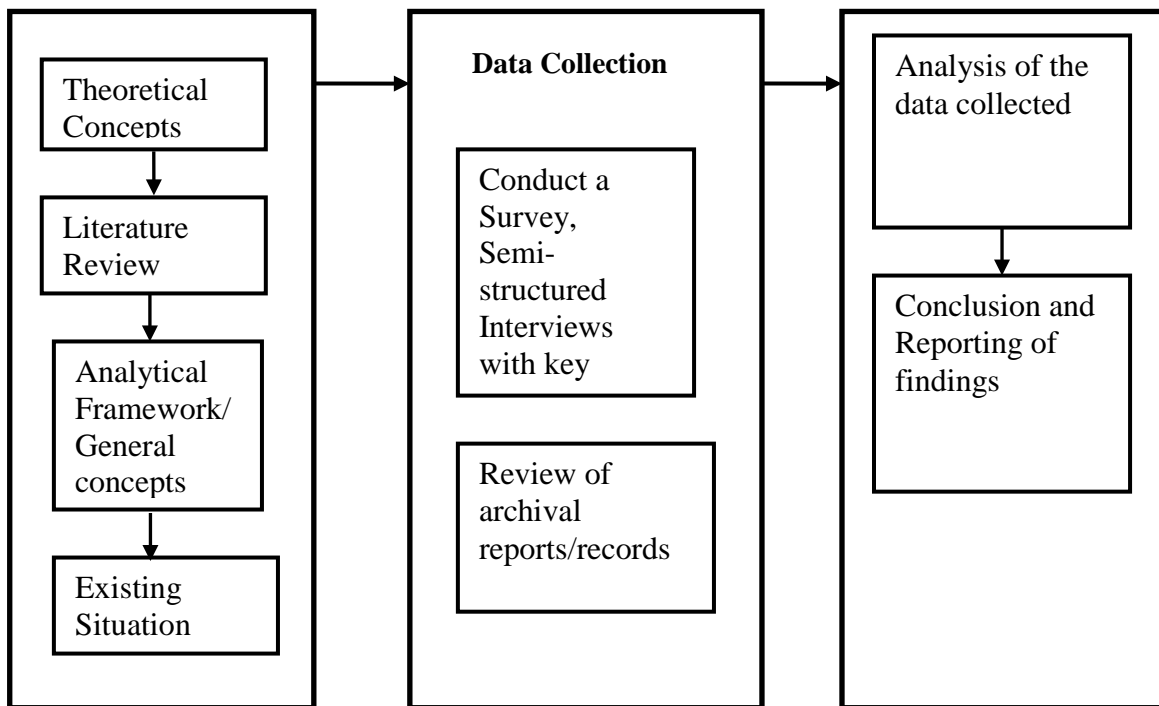


Figure 3-2 Research flow diagram

4 Data and Findings

4.1 General

4.2 National Water and Sewerage Corporation, Uganda

4.2.1 Introduction

The National Water and Sewerage Corporation (NWSC) is a statutory body established in 1972 with the responsibility to deliver water supply and sewerage services to urban centers entrusted to it. Ownership lies with the government of Uganda and the NWSC Board of Directors has the role of management oversight. The Board of directors is appointed by the Minister of Water and Environment who also appoint the Managing Director. Currently, there are six division each headed by a chief manager. The divisions are, Engineering Services, Institutional Development and External Services, Management Services, Finance and Accounts, Commercial and customer Services and Internal Audit.

The large towns of Kampala, Jinja, Entebbe, Tororo, Mbale, Masaka, Mbarara, Lira, Gulu, F/Portal, Kabale and Soroti have access to sewerage facilities, accounting for a coverage of a mere 7%⁷ of the total population in the towns total population (Uganda Water and Sanitation Sector-Performance Report, 2007). The low coverage is attributed to high investment costs compared to water supply which cost about \$2 per cubic meter

⁷ According to the International Standards Organization (ISO, 2005) coverage and availability of wastewater services is the number of properties with access to wastewater services/total number of properties in the geographical area covered by the responsible body x 100%.

of sewage and \$0.35 per cubic meter of water produced (i.e. 6times), NWSC annual report 2006/2007. Another factor is the availability of on site sanitation systems such as septic tanks, pit latrines and other wastewater management options in urban areas. Most of the wastewater treatment facilities in all towns except Kampala comprise oxidation ponds. These ponds were constructed when the towns were small and their populations low. According to the National Population Census Reports 1969 – 2002 population has more than doubled and stands at approximately 1,863,580 for the towns aforementioned only. See figure 4.3. The capacity of the oxidation ponds is too low to cope with the increased waste load resulting from increased population in these towns which have expanded rapidly population trends. This is complicated by poor maintenance of the existing facilities. In Kampala (Bugolobi wastewater treatment works) is prone to frequent break down of treatment units and this affects the efficiency of the plant significantly.

Save for the area of Entebbe and Lira, analysis of wastewater quality for all towns for the period 2004/2007 revealed no improvement. The graph below shows the BOD⁸ trends for towns under the operation of NWSC. Details of the quality of the effluent for different parameters are appended. However, regarding sewerage services standards, NWSC managed to respond timely to spillages and overflows, see table 4.3.

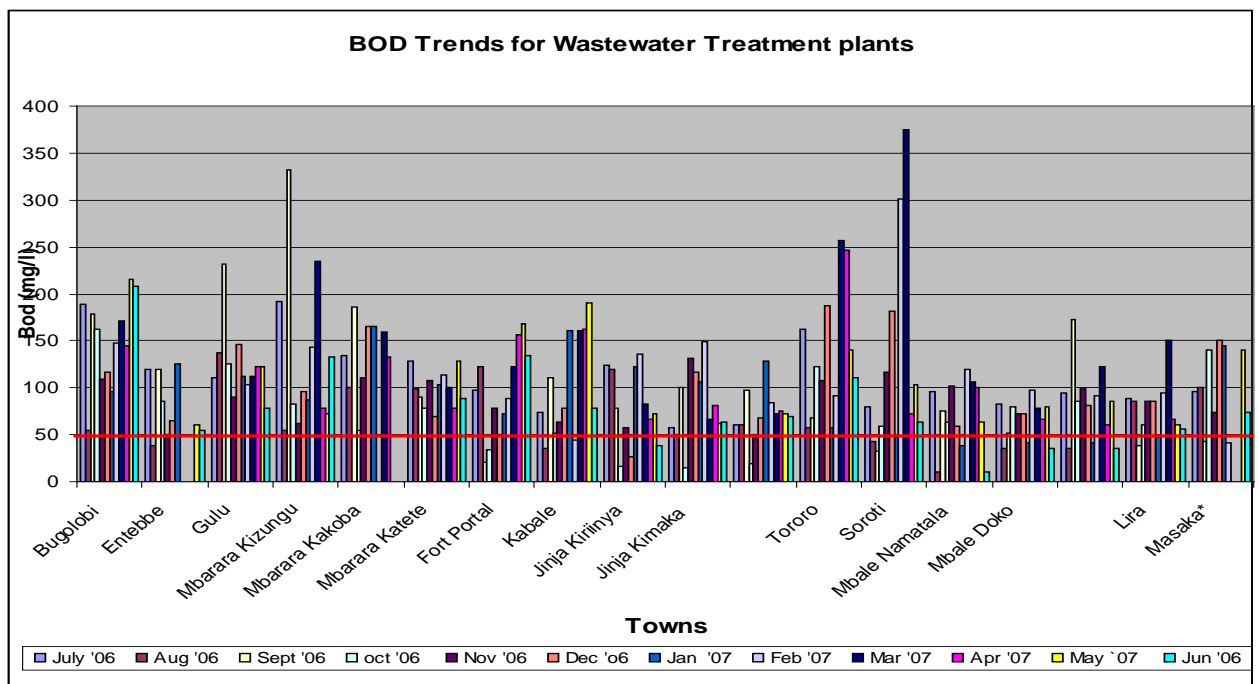


Figure 4-1 Trends in BOD Loading from NWSC Towns

4.2.2 Wastewater Services

The service coverage for sewerage services as at June 2007 was about 7%. Despite the introduction of a new simplified sewerage connection policy⁹ in the FY 2006/07, new

⁸ The standard for BOD is 50 mg/litre but wastewater discharged had values in the range of 40 – 330 mg/litre.

⁹ **The Simplified Sewer Connection Policy:** In order to bolster the number of new sewer connections, the NWSC Board approved the implementation of a new sewerage connection policy, which became

sewer connections remained very low at about 250 per annum. The major reason for the low sewer connection rate is the limited sewerage network coverage, and the reluctance of customers to connect to the sewer system due to the fact that most of them already have onsite sanitation facilities.

Table 4.1 Cost of sewers versus septic tanks analysis

| All in US\$ discounted for inflation 6.5% | Sewer Connection | | Septic Tank | |
|---|------------------|----------|-------------|----------|
| | Medium | High | Medium | High |
| Relative water consumption | | | | |
| Construction Cost | 1,075.91 | 3,586.36 | 3,007.16 | 3,341.29 |
| Sewerage Connection | 88.30 | 88.30 | - | - |
| Average Annual Opex | 153.93 | 247.14 | 38.37 | 44.20 |

In case of the existing property already served by a septic tank, the high operation cost seems to be the inhibiting factors to connect to the sewer. The same reason may not explain why the properties not connected to the sewer and have no septic tanks cannot connect since the connections are being provided free. This brings us to the sanitation coverage and Table 4.2 provides an overview of the sanitation facilities for Kampala only. According to the Kampala sanitation master plan survey, nearly 50% with septic tanks responded that they would want to connect to the sewer (Sanitation Strategy and master plan for Kampala city, 2004).

Table 4.2 Breakdown of sanitation coverage in Kampala

| Sanitation Category | 1991 census data for Kampala District % | KSMP % |
|---------------------------|---|--------|
| Sewer NWSC | 9 | 6.4 |
| Septic Tanks | 5 | 17.5 |
| Pit Latrines (not shared) | 12 | 27.9 |
| Pit latrines (shared) | 72 | 42.0 |
| No sanitation facility | 2 | 6.2 |
| | 100% | 100% |

Source: Kampala Sanitation Master Plan report April 2004

Table 4.3 Trends for Service Standards for wastewater

| Year | 2002/03 | 2003/04 | 2004/05 | 2005/06 | 2006/07 |
|--------------------------------------|---------|---------|---------|---------|---------|
| New sewerage Connections | 104 | 153 | 262 | 229 | 333 |
| Total Sewerage Connections | 13,209 | 13,362 | 13,624 | 13,853 | 14,186 |
| Percentage Growth | 1% | 1% | 2% | 2% | 2.4% |
| Sewer Extensions (kms) | | 20 | 7.2 | 10 | 2.32 |
| Av. Response time to sewer overflows | 6 | 6 | 5 | 4 | 3 |

4.2.2.1 Investment in Sewer Extension

effective from 1st July 2006. The following guidelines are to be: i) all customers whose premises are within a distance of 60 meters from NWSC sewer mains are covered ii) the NWSC provides all materials for installation of sewer lines and iii) customers are required to pay for the connection fee of approximately \$105 only .

The investment in water and sewer extension is financed by funds generated internally. In the year 2006/2007, sewer extensions have reduced to a mere 2kms for all areas operated by NWSC.

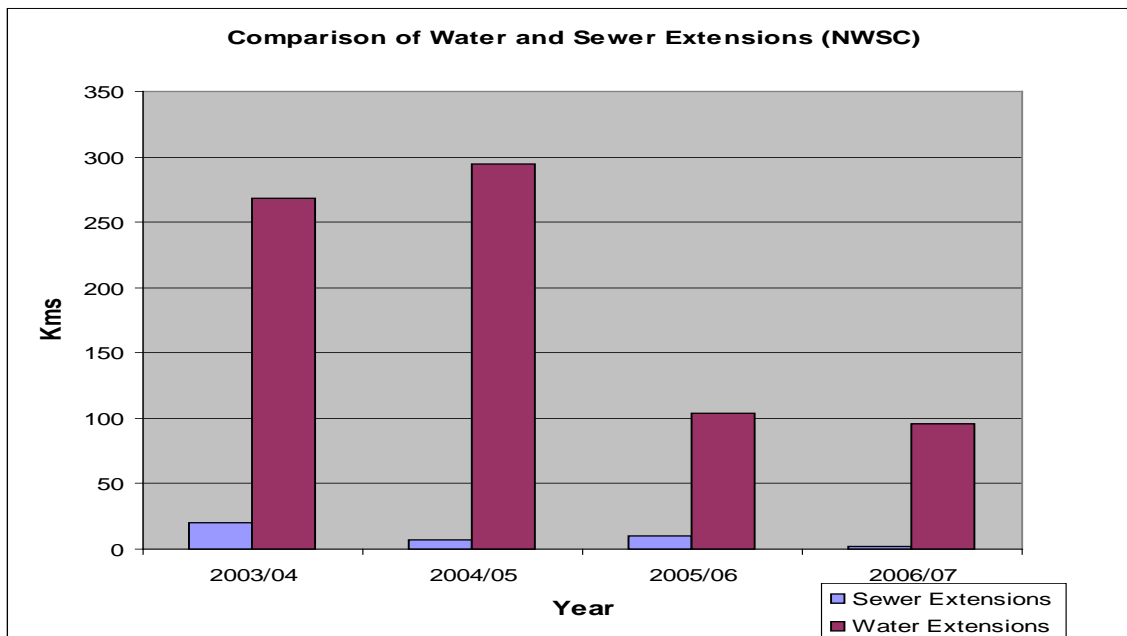


Figure 4-2 A graph comparing water and sewer extensions

4.2.3 Population Trends

Population dynamics is a very important factor for national and urban development. Kampala is a rapidly growing city at a rate of 5.6% per annum with a current population of about 1.47 million people. Sewerage coverage is estimated at about 7 to 8 % implying that the rest of the people use on-site sanitation systems or do not have sanitation systems at all. For a rapid growing city like Kampala, on-site sanitation systems may not be sustainable. The sewerage system needs to be expanded at a much higher rate to cope up with the ever increasing population.

Table 4.4 Kampala Population Trends and Projections 1991-2015

| Year | 1991 | 2002 | 2006 | 2010 | 2015 |
|----------------------|------------|-----------|------------|------------|-----------|
| Population (Kampala) | 774,241 | 1,208,544 | 1,479,741 | 1,811,794 | 2,400,000 |
| Growth rate | 4.76% p.a | 5.61% p.a | 5.6% p.a | 5.6% p.a | 5.6% p.a |
| National Urban Pop. | 1,889,622 | 2,921,981 | 5,000,000 | 7,500,000 | 9,800,000 |
| Growth Rate (urban) | 10.13% p.a | 5.46% p.a | 17.8% p.a. | 12.5% p.a. | 6.1% p.a |

Source: National Population Census Reports 1969 – 2002 and Projections

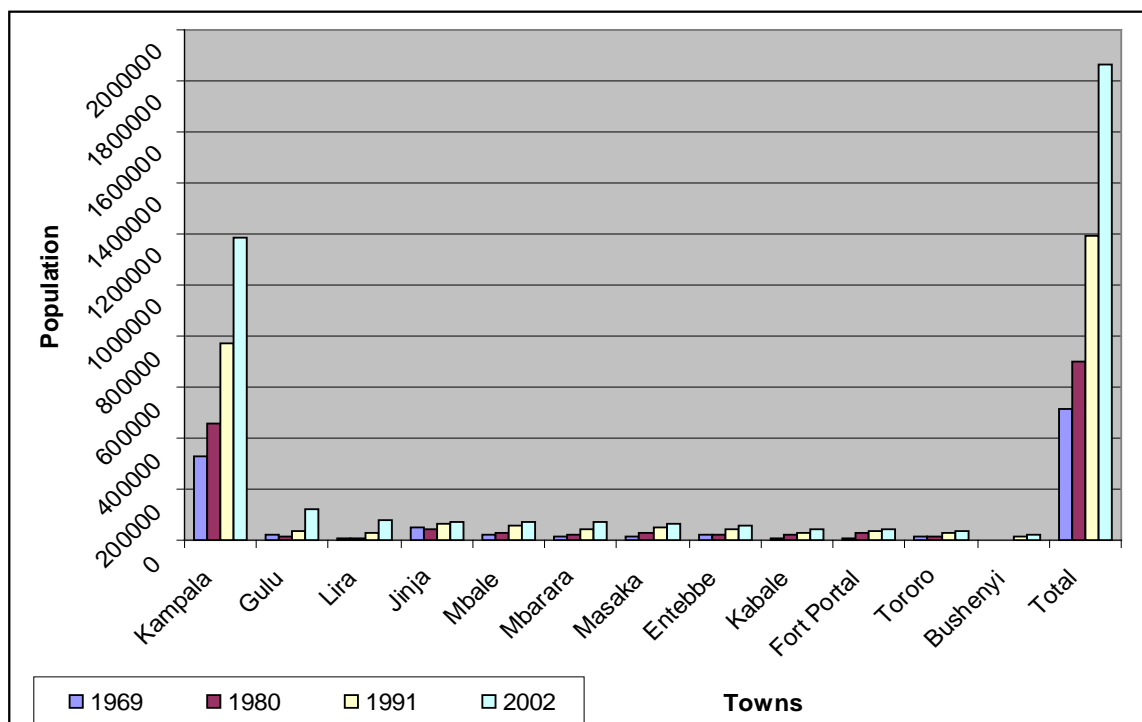


Figure 4-3 A graph showing population growth in town with access sewerage facilities

4.2.4 Utility Environment (NWSC)

1) Organizational autonomy

The aspects handled to establish the level of autonomy included policy autonomy, regulation autonomy, legal autonomy, and financial autonomy.

Table 4.5 Indicators for Organization autonomy

| Key indicators for Organizational autonomy | NWSC | Score |
|---|--------------|----------|
| The utility is responsible for setting quality standards for wastewater | No | 0.0 |
| The utility is responsible for setting service standards | Yes | 1.0 |
| The utility is responsible for setting the institutional setup | yes | 1.0 |
| The regulator is responsible for ensuring that the utility meets standards for wastewater | Yes, quality | 0.5 |
| The regulator ensures service standards for wastewater | no | 1.0 |
| Does deviation from standards result into some form of penalty from the regulator? | yes | 0.0 |
| Have penalties been applied | No | 1.0 |
| The utility covers operational expenses for wastewater services provision | Yes | 1.0 |
| What is the percentage of operational expenses covered by the utility | 100 | 1.0 |
| The utility sets the tariff for wastewater services | No | 0.0 |
| The utility proposes tariff adjustment to the regulator | Yes | 1.0 |
| Total | | 7 |
| Index for Organizational Autonomy = 7.5/11 = 0.68 | | |

Policy Autonomy: The case of NWSC the National Environmental Management Authority (NEMA) is responsible for setting quality standards for wastewater treatment. The NWSC sets the service standards for wastewater services provision. Municipal and town environment offices are also obliged to monitor the quality of the effluent from wastewater treatment plants.

NEMA, the authority charged with setting and monitoring of wastewater discharge standard in Uganda delegated the issuing of discharge permits to the DWRD. Accordingly the DWRD is supposed to issue, monitor and punish in case of defiance to conditions set in the discharge permits. DWRD is required to prepare a monitoring report annually as way of accountability to NEMA. The DWRD is the regulator charged with the responsibility of ensuring that the utility meets the specified standards. Despite the clear criteria for monitoring quality, the regulator does not monitor the quality of the wastewater discharged; consequently, no sanctions (revoking of the discharge permits) have been invoked. Internally the quality is monitored on a regular basis.

Delegation of authority to DWRD notwithstanding, NEMA is supposed to regularly monitor compliance to the set standards but not to carry out a detailed analysis. In case of non-compliance NEMA is mandated to close after giving an appropriate time under which an undertaking is required to comply. They have done it to check the level of heavy metals. However, monitoring has not been effectively done and this is attributed to limited capacity in NEMA to perform that duty coupled with other functions of the authority.

The regulation is weak; penalties and incentives have never been applied on wastewater services.

Legal and Structural Autonomy of the Utility: The NWSC was founded by the decree no. 34 of 1972, which was repealed by statute no. 8 of 1995. It is this statute also known as the NWSC statute that governs the operations of NWSC. Under this statute the NWSC mandate is to operate and provide sewerage services in areas entrusted to it under the Water Act on a sound commercial practice (National Water and Sewerage Corporation Act, 1995). The NWSC has a legal personality under the public law created by a parliamentary act.

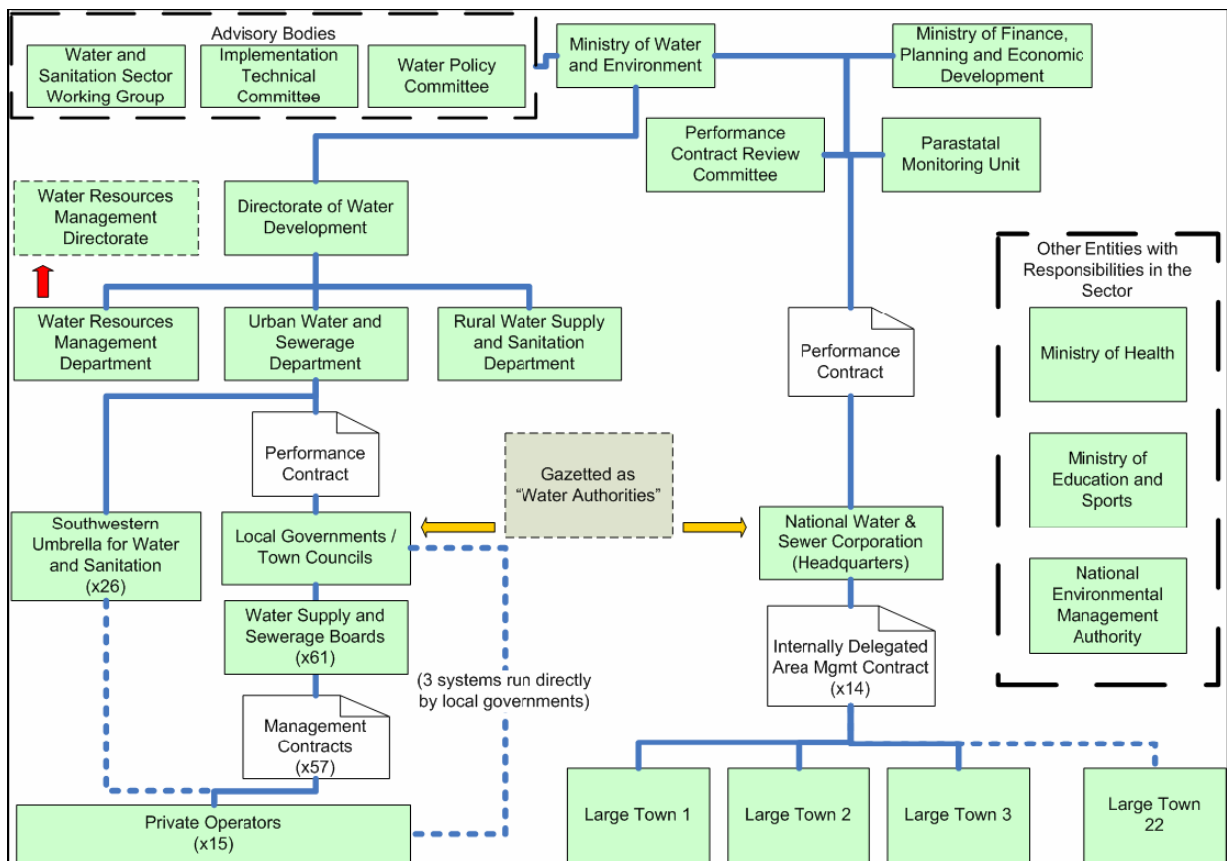


Figure 4-4 Regulation and Service Provision in Uganda’s Urban Water and Sanitation Sub-Sector

Source: Adopted from the Draft Concept Report, Strengthening NWSC into an Asset Holding Authority.

Under this act the NWSC has the mandate to operate and provide sewerage services, in areas where it is appointed to the extent and standards that may be determined by its corporate plan, any performance contracts, and regulations under the act or the Water Act. The utility has the mandate to develop water and sewerage systems in urban centres and big national institutions throughout the country.

The functioning of the utility is overseen by the Board of Directors (BoDs). It consists of the chairman, the managing director, and seven other members. The BoDs is the policy making body of the corporation charged with:

- a) Deciding the policy and strategies to be followed by the corporation in achieving its objectives
- b) Ensuring that the corporation and the managing director perform their functions and exercise their respective powers in a proper, efficient and economical manner, in accordance with a) above.

Six (6) of the board members are appointed by the minister save for the managing director. The Director of (DWRD) is also an automatic appointment to the Board. The directors other than the managing director serve for a period of three terms but they are eligible for reappointment. The directors must have qualifications and relevant experience in the business of the corporation, public finance, banking or economics, water supply or sewerage engineering, business management, commerce or industry,

environment management and public health. There are clearly laid out procedure for removal of a board member.

The managing Director is appointed and evaluated by the board and serves a renewable five (5) year term.

Financial Autonomy: Operation and maintenance of the existing sewerage systems is funded by the NWSC. The O&M functions are primarily through income from tariff, and other sewerage charges/prices for dumping sewage from septic tanks to the wastewater treatment plants. However, the Utility has acquired donor funding in the recent past to update the current sewerage system. The most recent case is the Lake Victoria Environmental Management Programme (LVEMP), which funded the refurbishment of the Bugolobi sewage treatment plant and sewerage booster. Financial resources available are not enough to cover for the provision of sewerage services due to high costs of sewer installation and sewage treatment construction costs. The major part of the capital budget is financed by donors and the government. The procedure for establishing the wastewater tariff is highlighted under commercial orientation sub-section. Procurements follow procedures laid out by the Public Procurement Disposal of Public Assets Authority (PPDA). Accordingly, the NWSC takes financial decision within strict procedures set by the central government through its arm of (PPDA).

Conclusion: The NWSC has a high level of policy autonomy, it may decide upon which policy instruments to use and output norms within the objectives set by the government under the NWSC act and the water act. The NWSC has a legal personality under the public law decisively NWSC has a high legal autonomy. Financing of wastewater services is through income from the tariff and sewerage surcharges. Financing of capital expenditure is from the government and donor funding. This reflects a low level of financial autonomy. The head of NWSC is appointed and evaluated by a supervisory board which represent the government; this is a reflection of high level of structural autonomy. Overall, we can conclude that the NWSC highly autonomous utility providing wastewater services.

2) Leadership of the Utility

Most of the facilities for wastewater were not up to the standard compared to those of water treatment plants. According to the survey conducted respondents were of the opinion that wastewater was not given emphasis like water supply and one wrote “in the past it was used a “jail” for non performers to settle grudges”. This could have led to the deterioration of the plant units and the system in general. The status qua has since changed and management has began to give attention to sewerage services looking at the experience and training of staff.

Speaking at the signing ceremony at the National Water Sewerage Corporation (NWSC) works at Bugolobi on February 8, Ambassador Vincent de Visscher, the Head of the EC delegation in Uganda, challenged the body to put more emphasis on sewerage management in the city “Daily Monitor Publication Monday, February 11, 2008. This was at the signing ceremony between European Commission and the government have signed agreements totalling Shs20.5 billion (€8,512,670) to improve sanitation and the quantity of water in the city. "Sewerage must be pushed up the agenda even further," he said. This requires commitment and two areas in particular stand out: revenue generated through sewerage charges should be reinvested in the sewerage system and not used to

subsidize the water supply system," He advised NWSC management to create a dedicated sewerage department that is equal in status to that of water supply

From the survey conducted, to establish the level of leadership, leadership was rated at 65%. From table 4.6 which shows the summary of the survey results, most of the respondents were of the view that leaders were not going out of the field but they set clear performance standards and were giving feedbacks. Overall, we can conclude that the level of leadership provided is average, with little emphasis given to wastewater services provision.

Table 4.6 Indicators for leadership

| Key indicators on Leadership | Max | Av. Score | Std Max | Std, Score | Std. Dev. |
|---|------------|------------------|----------------|-------------------|------------------|
| Leaders here serve as positive role models (e.g. honest, hardworking, balances peoples needs with organizations needs, is enthusiastic) | 5 | 2.9 | 1 | 0.58 | 0.199 |
| Leaders here have sufficient level of knowledge to inspire others | 5 | 3.3 | 1 | 0.66 | 0.165 |
| Leaders here listen as well as instruct | 4 | 3.2 | 1 | 0.8 | 0.258 |
| Leaders here get out into the field and/or visits other offices | 4 | 2.2 | 1 | 0.55 | 0.158 |
| Leaders here demonstrate competence and are visibly interested in wastewater services | 5 | 2.9 | 1 | 0.58 | 0.199 |
| Leaders here specify clear performance standards for wastewater and are strict but fair, gives positive and negative feedbacks | 5 | 3.2 | 1 | 0.8 | 0.329 |
| Leaders here continuously guide technical staff to ensure that levels of technology used are suitable in terms of simplicity of operation and maintenance | 5 | 3 | 1 | 0.6 | 0.163 |
| Total | | | 7 | 4.57 | |
| Performance on a scale of 0 - 1, 4.57/7 = 0.65 | | | | | |

3) Corporate Culture

The mission of NWSC is "To provide efficient and cost effective water and sewerage Services, applying innovative managerial solutions to the satisfaction of our customers". The mission is clearly displayed in all offices and appears in most reports and the website. It outlines the objective of wastewater services provision.

Table 4.7 Indicators for corporate culture

| Key Indicators on Corporate culture | NWSC |
|---|-------------|
| The utility has a mission clearly outlining wastewater services | Yes |
| The mission is clearly displayed for all people to read and understand | Yes |
| Do people know the mission? | yes |
| Managers assist staff to understand and work towards the achievement of the mission | yes |
| The utility has an organization chart clearly delineating the functions of wastewater services | Yes |
| The utility has a core group of people working in wastewater department over the past ten years | yes |

Key Indicators on Corporate culture

NWSC

The utility has a high staff turnover

No

Conclusively, NWSC showed a very good corporate culture which is mission oriented.

4) Customer Orientation

The utility mainly conduct customer survey for water supply and since the bill for wastewater services is infused with that of water, opinions of customers on wastewater services is sometimes obtained.

The NWSC has a training program that delivers training to staff that interact with customers and these include technical staff in sewerage services. The utility has a customer charter detailing the nature of services that utility commits to provide. This charter is skewed towards water services and it does not incorporate compensation payments if the NWSC fails to meet its obligations for wastewater services.

Table 4.8 Indicators for customer orientation

| Key Indicators on Customer Orientation | NWSC |
|---|-------------|
| The utility is dependent on its customers for financing wastewater services | Only O&M |
| Does the utility conduct customer surveys | No |
| The utility has instruments to establish customers opinions regarding wastewater services | No |
| The results from customers opinions are incorporated into operation of the utility | No |
| The utility has instruments (customer charters, customer contracts, etc) in place to arrange for rights of customers | No |
| The utility incorporates compensations payments in case it fails to meet its obligation | No |
| The utility has instruments in place and trains staff in dealing with customers for issues related to wastewater services | Yes |
| Customers are involved in decision making in the utility for issues related to wastewater services | No |
| What percentage of complaints for wastewater is addressed | 80-90% |

Analysis of key indicators in table 4.8 revealed that NWSC has a low level of customer orientation with respect to wastewater services. Where as customer surveys were carried out, they were mainly for water supply they were not for wastewater.

5) Commercial Orientation

To improve operation efficiency, the department of wastewater services particularly for Kampala, works under a performance contract. For other smaller towns, operation efficiency for wastewater services is ingrained in the general contract for management of the area (Internally Delegated Management Contract, IDAMC). To improve staff productivity, the staff energies are focused on the department targets and there are daily task planners and annual staff appraisals.

The sewerage charge for all properties connected to the sewers is a function of water consumed. All other properties (institutional/Government and Industrial/Commercial) save for domestic category that are charged 75% of the water charge, are charged 100% of their water charge. The wastewater tariff is not related to the cost of providing

sewerage services but it is on the supposition that for commercial purposes 100% of the water is discharged into the sewer system and for domestic properties, approximately 75% is discharged into the sewer system. Recently the tariff was indexed to allow for a 7% sewerage surcharge. This will enable the NWSC to make free sewer connection of premises within 70 meter radius of the sewer network. The indexation took into account the cost for providing free sewer connections within the specified distance. Table 4.9 show the tariff for each customer group.

Table 4.9 Water Tariff for NWSC

| Service Type | Tariff in US dollars ¹⁰ \$/M ³ | Sewerage Tariff |
|---|--|-----------------|
| public standpipes | 0.5 | - |
| residential/domestic customers | 0.8 | 0.60 |
| Industrial/commercial rate first block | 1.0 | 1.00 |
| Industrial/commercial rate second block | 0.9 | 1.00 |
| Average Tariff | 0.8 | 0.87 |

The water tariff is indexed annually and this effectively has an impact on the charge for wastewater.

To reduce costs;

- The utility has made strategic alliance with service providers for bulk purchases.
- The utility is in cohort with the Uganda telecommunications company for reduced telephone bills and the electricity distribution company.
- Leasing of vehicles instead of out right purchase is another way the utility is reducing costs.
- Out sourcing/contracting of services e.g. debt management, Information technology management, cleaning services and many others one off maintenance works.
- To reduce staff costs, the utility has harmonized the medical schemes to reduce abuse by limiting the number of dependants to only biological dependants.
- Other cost reduction measures include carrying out of the planned preventive maintenance to sidestep breakdowns which are very costly.

Table 4.10 Indicators for commercial Orientation

| Key Indicators on Commercial Orientation | NWSC |
|---|-------------------------|
| The tariff for wastewater takes into account consumers perception of the service and their willingness to pay | No |
| The tariff cover operational costs for wastewater services | yes |
| What extent does the tariff recover operational expenses for wastewater services | 100 |
| The utility has marketing activities to ensure consumers pay for wastewater services | Yes together with water |
| What is the billing collection ratio | 95% |
| The utility employs cost reduction measures | High |
| The utility has programs in place to improve operational efficiency? | Yes |
| The utility sets performance targets relating to operational efficiency? | Yes |

¹⁰ The exchange rate is 1uganda shillings is equivalent to 0.000585 US dollars and the rates are VAT exclusive.

Key Indicators on Commercial Orientation

NWSC

There are rewards and penalties related to operational efficiency?

Yes to both

Overall, it appears the activities within the NWSC with respect to wastewater services provision are commercial driven hence NWSC has a strong commercial orientation with respect to wastewater services despite the fact that the wastewater tariff is not related to the cost of providing sewerage services.

6) Technical Capacity

The department of wastewater services lies under the Engineering division. The division is head by a Chief Manager who is and Engineer by qualification. The division and the department have engineers and project managers who are charged with the duty of making technical decisions at different levels. The project managers who have qualifications in project management and with Engineering back ground are charged with the quality of work. The Utility hires consultants who ensure quality of the big projects executed.

Kampala service area has a department dedicated for sewerage services. Other areas have no separate section for sewerage services, the technical functions of wastewater services are handled by the area engineer. The department of sewerage services in Kampala is head by the manager who has a back ground of civil engineering. In the department there are other engineers in charge of the treatment plants and the sewage collection system. These are charged with the routine technical decision making and implementation. It has plumbers, electrician and mechanical personnel among other technical people.

In past few years, the utility with the Kampala municipal council under took a study “Sanitation strategy and master plan for Kampala city” to ensure that future sanitation practices are well managed. This was a world bank funded project aimed at providing a framework and strategy for efficient and cost effective provision of either on-site or water borne sewerage services in Kampala. Implementation of the Kampala Sanitation master plan study is under way and Sanitation Strategy for other 14 towns will follows closely. Execution of the above project which will be done in phases will be undertaken by a contractor under a supervision of a consultant on behalf of the utility. The utility has qualified and experienced staff under the Project Implementation Unit (PIU).

The technologies used in the treatment process include the conventional sewer systems and wastewater stabilization ponds for small towns. The conventional system has a major problem of spare parts; they are not locally available. However, the conventional system is only in Kampala city and with the Sanitation master plan, it will be improved and ponds constructed to replace the current system which is expensive to manage.

Table 4.11 Indicators for technical capacity

| Key Indicators on Technical Capacity | Maximum Score | Average Score | % | Std. Deviation |
|--|---------------|---------------|----|----------------|
| The utility has technical staff to make technical decision | 5 | 3.7 | 73 | 0.492 |
| The utility has experienced and qualified staff in wastewater services | 5 | 3.6 | 72 | 0.515 |
| The utility has qualified and experienced | 5 | 3.5 | 70 | 0.522 |

| Key Indicators on Technical Capacity | Maximum Score | Average Score | % | Std. Deviation |
|--|----------------------|----------------------|-------------|-----------------------|
| managerial staff in the wastewater services department? | | | | |
| There are enough and appropriate equipment to undertake projects? | 5 | 2.8 | 57 | 0.577 |
| The Utility undertakes new projects in wastewater services provision | 5 | 1.8 | 37 | 0.718 |
| The utility has enough and qualified staff to supervise new projects | 5 | 3.1 | 62 | 0.669 |
| The utility uses different and appropriate technologies for wastewater treatment. | 5 | 2.8 | 55 | 0.452 |
| The utility has qualified staff for undertaking research in wastewater services improvements | 5 | 2.1 | 57 | 0.718 |
| Total | 40 | 24.1 | 24.1 | |

Performance on a scale of 0-1, 24.1/40 = 0.60

From the survey, the NWSC has experienced and qualified staff to undertake technical decisions; however, there is inadequate facilitation for them to undertake their tasks. On 0-1 point scale, and considering the key indicators, the NWSC has substantial technical capacity rated at 0.6.

7) Development of human resources

Table 4.12 Indicators for development of human resources

| Key Indicators on Development of human resources | Max | Std Max | Av Score | Std Score | Std. Dev. |
|--|------------|----------------|-----------------|------------------|------------------|
| There is a transparent procedure for hiring staff | Yes | 1 | 1 | 1.00 | 0.000 |
| This procedure is followed | 5 | 1 | 3 | 0.60 | 0.211 |
| Manpower required to work in wastewater services is planned | 5 | 1 | 2.4 | 0.48 | 0.140 |
| There are performance indicators required for staff promotions | Yes | 1 | 1 | 1.00 | 0.000 |
| Staff salaries are comparable to the opportunities outside the utility | 5 | 1 | 2.3 | 0.46 | 0.232 |
| New staff go through a system of apprenticeship | 5 | 1 | 1.5 | 0.30 | 0.170 |
| You have a training programme for wastewater management | 5 | 1 | 0.8 | 0.16 | 0.084 |
| There is a system of knowledge transfer among staff | 5 | 1 | 2.9 | 0.58 | 0.148 |
| Total | | 8 | | 4.58 | |

Performance on a scale of 0-1, 4.58/8 = 0.57

According to the survey, development of human resources with respect to wastewater services was rated low at 0.57 0 -1 point scale. From the survey, it was established that there is no formal training program dedicated to sewerage services and the system for

apprenticeship for new staff was very weak. This is closely linked to the technical capacity which was rated at 0.6.

8) Internal Accountability

The Board of directors for NWSC meets regularly sometimes twice a month. The issues addressed at board meeting are not dichotomized between water and sewerage. However, issues concerning sewerage are addressed as they arise from time to time.

The managing director is required to accomplish the set targets for wastewater in the annual and corporate plan for the utility (NWSC corporate plan, 2006-20090).

- To increase sewerage extensions by 60kms
 - Ensure sewerage effluent meets national standards
 - Implementation of the Kampala Sanitation Master plan study and Sanitation strategy for the other 14 towns
- } Corporate plan targets
- Install 833 new sewer connections
 - Extend sewer by 12 kms
- } Annual plan targets

There are no penalties and/or rewards are for achieving wastewater targets. The current penalty and reward formulas are skewed towards water services indicators see appendix 5 for reward and penalty structure. Nonetheless, in the contract between the government and the NWSC, there are qualitative targets for wastewater services which the utility must execute such as the implementation of the Kampala sanitation master plan (NWSC Performance contract, 2007).

Internally, the wastewater services section operates on a performance contract with clear set targets. Some of the set targets rotate around the quality of the wastewater effluent and other operational indicators. There are service standards the individual department for wastewater services is required to meet among them being the number of new sewer connections, response time to customer queries, clearing of spillages and/or overflows, accomplishment of the planned preventive maintenance among others.

The staffs prepare individual goals and daily task list as a mean of accountability. There are annual staff appraisal and monthly reports/evaluation. It is on the basis of the appraisal and evaluations that the staff are promoted. However, there are no cases of direct penalties for underperforming.

Table 4.13 Indicators for internal accountability

| Key Indicators | NWSC | Score |
|--|---------|-------|
| How often does the utility management meet with the Board of Directors? | Monthly | 1.0 |
| Are there performance standard for wastewater required of the Managing Director by the Board of directors | Yes | 1.0 |
| Are their penalties and/or rewards applied to the Managing Director by the Board of Directors for achieving specified performance targets? (for wastewater services) | No | 0.0 |
| Are staff required to meet specific performance standards set by management? | Yes | 1.0 |

| Key Indicators | NWSC | Score |
|--|--------------------------|--------------|
| Are penalties and rewards applied to staff by the management for achieving specified wastewater performance targets? | No penalties/Yes rewards | 0.5 |
| Staff is subjected to annual evaluations on the functioning in the utility? (yes/no) | Yes | 1.0 |
| Total | | 4.5 |
| Internal Accountability Index = 4.5/6 = 0.75 | | |

Overall, NWSC showed high levels of internal accountability on the part staff for results, with incentives pegged to performance targets. However, some of the set targets e.g. the number of targeted new connections is very low and the extensions of 12 kms globally for NWSC is too low. Also there were targets required of the Managing director but no system of rewards and penalties.

9) External Accountability

The case of NWSC the government requires the utility to meet some obligation for wastewater services provision as aforementioned. The operational indicators highlighted in the contract related to sewage were; implementation of the Kampala Sanitation Master Plan and sanitation strategy for other 14 towns under NWSC. However, the available contract signed between the government of Uganda and the NWSC, there were no specific performance indicators for wastewater services.

There is a general formula for computation of penalties and rewards. However, a close scrutiny of the formula showed that the individual elements were to do with water services. The penalty or rewards for wastewater services was imbued in the working (WR) and revenue collection since the expenses and revenue collection contained the wastewater component. The formula is in appendix 5. In the contract, one of the major components is Return on Capital Employed (RoCE). However, as seen from the background information RoCE appears to be acting as disincentive for investing in wastewater facilities since the pay back period is very long and initial investments cost very high. The contract does not allow for penalties and rewards for operational indicators.

The NWSC is subjected to investment requirement by the government and donors. NWSC provides counter part funding for donor funded projects and as previously mentioned, it supposed to show return on capital employed. Financing of major projects in wastewater are funded by donors, government and counter part funding by the NWSC. The NWSC has not obtained loans from lending agencies and financial institutions specifically for wastewater services provision.

The NWSC is required to meet quality standards set by the ministry. The quality standards are related to the discharge of wastewater (BOD, COD, TSS, faecal coli-form and nutrients). These standards are accordance to those set by the World Health Organization (WHO), Uganda Bureau of Standards (UBOS), and International Standards Organizations (ISO). There are financial penalties for discharging wastewater that does not meet these standards and/or revoking the discharge permit. However, none of the above mentioned have been monitored and penalties applied at anyone moment by the regulating body.

The NWSC is expected by the government to meet service standards for wastewater services. It is expected to clear blockages and respond to customer complaints within a reasonable time, 24 hours. The NWSC managed to respond timely to spillages and overflows and managed to improve sewerage effluent without punitive measures.

Table 4.14 Key indicators for External Accountability

| Key Indicators | NWSC | Score |
|---|-------------|--------------|
| Does the utility have to meet specified performance indicators (standards) for wastewater services? | Yes | 1.0 |
| Have these standards been monitored | No | 0.0 |
| If yes, is the utility subjected to penalties and/or rewards to ensure compliance?) | Yes | 1.0 |
| Have penalties and/or sanctions been applied | No | 0.0 |
| Does the utility produce annual reports clearly showing the achievement in wastewater | Yes | 1.0 |
| Are external groups represented in advisory or board of directors' body? (NGO's, customer groups, government, financing institutions) | Yes | 1.0 |
| Has the utility secured any loans from lending agencies to undertake wastewater activities? | no | 1.0 |
| If yes, do the loans require achievement of some performance indicators? | no | 0.0 |
| Total | | 5 |
| External Accountability Index = 5/8 = 0.625 | | |

Overall, the NWSC showed low levels of external accountability with respect to wastewater services. There are no penalties or rewards for set targets and where there are sanctions they have never been applied. The only visible form of accountability is the provision of counter part funding when donors are financing activities.

10) Interaction with key external institutions

According to Fridtjof (Technical Adviser gtz), the case of NWSC, sewerage was not perceived to be a big business for NWSC. Although approximately 30% of the revenue collected by NWSC was from sewage, only 10% of that was reinvested. Effectively, sewerage was subsidizing water investments. According to him, "Donors have a great influence on the performance of the wastewater sector in the utility; if wastewater was left to NWSC, little investment would go to sewerage". The influence is through funding; it is proposed to upgrade and expand sewerage system and implement appropriate and sustainable on-site sanitation solutions. The project is estimated to cost 14 million Euros and it will be 90% donor funded. This highlight the influence of external players like donors in the achieving improved performance in wastewater services provision. The NWSC is required to provide counter part funding and will be expected to improve on the wastewater service standards as away of accountability.

Further investigations revealed that there is a good working relationship between NWSC and the donors for many years and this relationship was to be extended by further six (6) years with the emphasis on sanitation services.

The government has always supported the NWSC through the provision of an enabling operating framework and assistance through provision of finances. The government has provided capital investment funds as counterpart funding to projects.

Non government organizations have little impact on the performance of NWSC since sewerage coverage is estimated at 7% leaving the 90% to other providers. However, NGO's have played a good role in providing sanitation services to areas that are not covered by the utility. These include cesspool trucks that empty septic tanks, Kampala Sanitation Urban Program (KSUP) Ugandan Water and Sanitation Network (UWASNET) as well as community based organizations (CBO)

Table 4.15 Indicators for interaction with external institutions

| Key Indicators | NWSC |
|--|-------------|
| The parent ministry provides financial support in improvement of wastewater services delivery? | Yes |
| The parent ministry has given support to revise the tariff in the past five years | Yes |
| The municipality offers support from the municipality | No |
| Donors have provided financial support to improve wastewater services | Yes |
| Nongovernmental organizations play an import role in the provision of wastewater services | No |
| The union has a great influence on the functioning of the utility | Yes |

Conclusively, external institutions play a big role and NWSC has maintained a good working relationship, more so with the donors and the parent ministry. This is manifested with the commitment from donors to finance the implementation of the Kampala sanitation master plan study.

4.2.5 Conclusions

The following is a summary of the performance for NWSC.

- The NWSC has low sewerage coverage at approximately 7% for all areas under its operation.
- It is characterized with low investments in sewer extensions and infrastructure.
- The quality of the effluent from the treatment plants is not meeting effluent standards albeit some improvement in some areas.
- NWSC has high response time to customer complaints and clearing overflows was done on average 5 hours.
- It is meeting it annual targets for new sewer connections about 250 annually but the target is very low.

Why?

- Little emphasis on sanitation by the NWSC compared to water supply. This had led to the neglect and eventual dilapidation of the wastewater treatment facilities. This partially explains the poor effluent quality recorded in al most all the wastewater treatment plants. The level of priority management gives influences the level of wastewater services provision.
- As can be seen from table 4.12 Internal Accountability contributed greatly to the utility improvement of the services standards for wastewater. Staff work towards achieving their targets once there is system for rewards and penalties.
- Little external accountability i.e. accountability to not very clear since system of rewards/penalties was skewed towards water supply. There are no penalties that have ever been invoked for not meeting specified standards. The requirement of

government for the NWSC to meet some level of return on capital employed appears to be restraining the utility to venture in wastewater investments.

- The regulation is weak and has given a lot of autonomy to the NWSC. It has not been enforced and this attributed to lack of capacity on the side of the regulator.
- Shift in donor funding from water supply to sanitation services has provided vicissitudes of priority to wastewater services provision. Implying that external institutions play a big role in sanitation provision more so it is donors who provide a greater portion of funds required for capital investment.
- The need to respond to customer need had improved wastewater service standards. NWSC is recording good response times since it is customer oriented.
- Regulatory framework for sewerage services provision one of the key factors that affect performance is very weak. It was not clear who is charged with monitoring the quality standards for wastewater. NEMA, which is charged with setting the standards, claimed that they had delegated the function of monitoring to DWD. DWD was not regularly carrying out this function because of capacity. NWSC was charged with setting the service standards for sewerage in that case it is the “persecutor and the judge”.
- It was not clear to verify the total collection from sewerage services. The tariff for sewerage services is imbued in that for water. The collections are all put under one basket and referred to as revenue collections. One tends to think that all the revenue collected is for water consumed.
- NWSC has trained and experienced staff dedicated to wastewater services but they lack facilitation to execute their duties.

4.3 Johannesburg Water, Johannesburg, South Africa

4.3.1 Introduction

Johannesburg Water in Johannesburg, South Africa, is a government owned company with a mandate to provide water and sanitation services to the 3 million inhabitants of Johannesburg. The only shares issued are owned by the city of Johannesburg, represented by the city council of Johannesburg. Since 2001-2006, Johannesburg water was under a management contract with Johannesburg Water Management (JOWAM) Company; a consortium of French and South African operating companies. Since June 2006, service provision is under the Johannesburg Water (Pty) Limited. It has annual turnover of \$173.7 millions¹¹ for water and \$93.5 million for wastewater.

The main objective of the management contract as envisioned by the City of Johannesburg in 2000 was to build a sustainable water and sanitation Utility in particular through an appropriate transfer of skills. JOWAM was remunerated through two incentives. The Incentive A represented the improvement of the service quality through five factors: Human Resource Development, Decreased Wastewater Spillage and overflows, Customer Service, Capital Investment Programme, Improved Operation and Maintenance of facilities. The Incentive B captured the improvement of the financial situation of the Utility. It therefore encapsulated also the improvement in UFW (Unaccounted for Water) (Management Contract between Johannesburg Water and JOWAM, 2006)

4.3.2 General Performance for the period 2001-2006

JW has a sewer length of approximately 9500km equivalent to the length for the water network and serving a population of about 3 million people representing sewerage coverage of approximately 90%. JW is charged with the sewer network and also carries out desludging of septic tanks and pit latrines for properties not connected to the sewer, to ensure high levels of sanitation services.

Due to tiny streams crossing Johannesburg situated on the continental divide, effluent quality standards to be met were stringent and the figure below show percentage compliance of all the wastewater treatment plants.

¹¹ The exchange rate is such that 1US dollar is equivalent to 7.481 Rand.

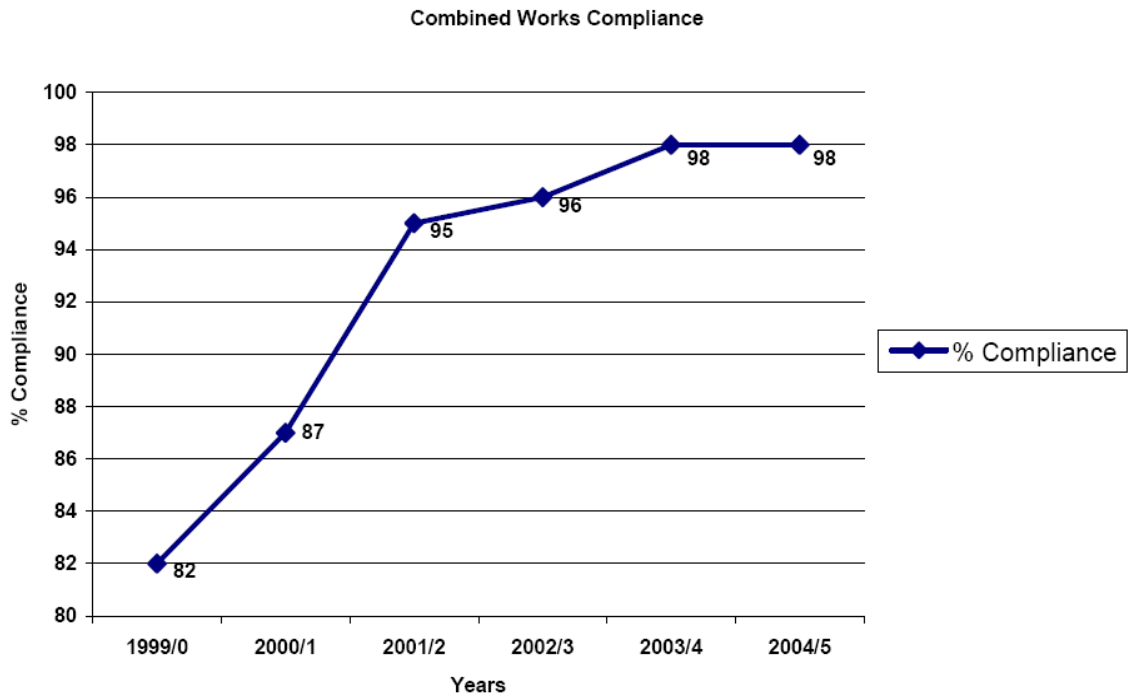


Figure 4-5 Percentage of sewage effluent compliance

Source: Adopted from Management Contract between Johannesburg Water and JOWAM (2001-2006), summary of the results achieved.

The spillages – overflows at the WWTW’s also decreased dramatically as represented on the graph below.

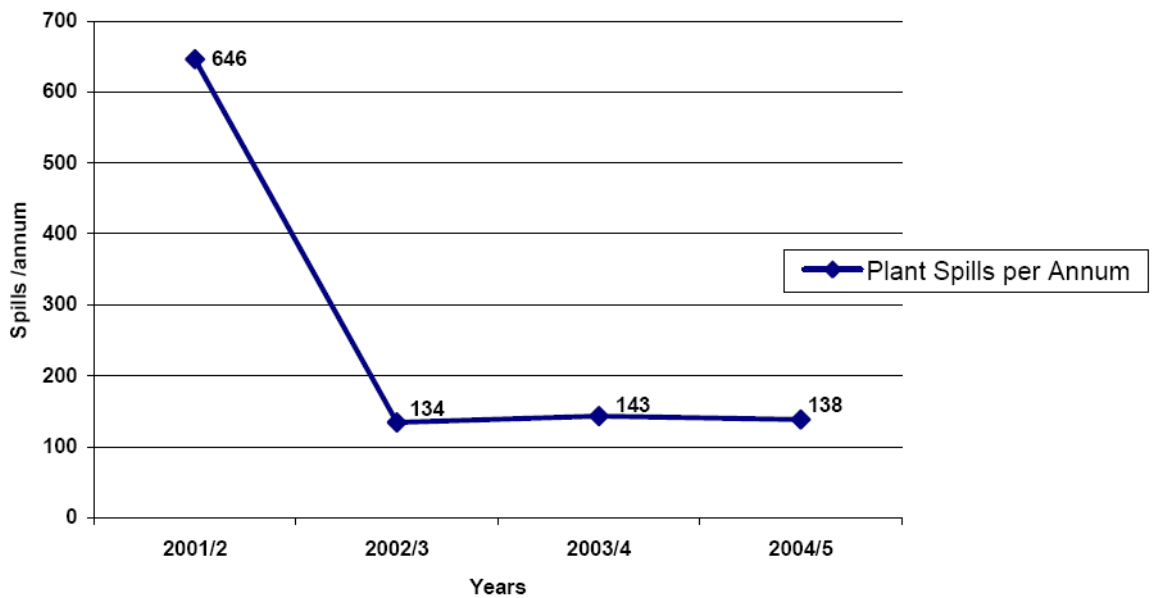


Figure 4-6 Reduction of sewage spills

Source: Management Contract between Johannesburg Water and JOWAM (2001-2006)

4.3.3 Utility Environment (Johannesburg)

1) Organizational Autonomy

The department of water and forestry is charged with the duty of setting up national standards. There are six wastewater treatment works (WWTW) within two (2) catchments and each plant has its own standards beside the national standards. These standards have been set for each plant as a drive towards achieving the national standards. Not all plants can work perfectly the same. Each plant has its own discharge permit. The utility sets service standards for the different branches six numbers under the utility.

Funding of the wastewater operations and maintenance is through funds generated from the tariff. As such, the tariff is sufficient to cover operation and maintenance but cannot cover capital expenditures. Capital investments are through the tariff and National grants, an equitable share provided by the government to help the local authorities. However, the funds generated from wastewater are sometimes used to subsidize water services for Johannesburg water. This is because there is no clear dichotomy in the revenue generated for water and wastewater services provision. The revenue collected is put under the same pool; similarly expenses are put under the same pool.

Legal and Structural Autonomy of the Utility

Johannesburg Water (Pty) Limited was incorporated on 21st November 2001 and commenced business on January 1st 2001. It is a Municipal entity owned by the city of Johannesburg and is mandated to provide water and sanitation services to the residents of Johannesburg. JW has only one shareholder, and is governed by an independent Board of Directors with 11 members, none of who are council members. The Managing Director and the Chief Finance Officer form part of the 11 members. Vacancies for the board are publicly advertised, and anybody can apply. A panel from the city council of Johannesburg interviews and selects board members from the applicants. These directors are non executive directors. They are selected by the City of Johannesburg and none of them is councillor or official from the City. They are selected on the basis of their expertise for a period of 3 years which might be renewed once

Conclusion: JW has low level policy autonomy, it may take decisions concerning structure and content of the processes within the lines and policy instruments, output norms, objectives and effect norms set by the municipal council and inline with government policy. The JW has a legal personality under the public law decisively JW has a high legal autonomy. Financing of wastewater services is through income from the tariff and sewerage surcharges. Financing of capital expenditure is partly from internal sources and contribution from the shareholder. This reflects a high level of financial autonomy. The head of JW is appointed and evaluated by a supervisory board which represent the municipal council; this is a reflection of high level of structural autonomy. Overall, we can conclude that the JW has relatively high level of organizational autonomy.

2) Leadership

Johannesburg has a simplified organization structure where managers of six operational areas report directly to head of division hence reducing bureaucracy. The managers have knowledge of wastewater treatment and some have the background of engineering. Decentralization of operations has enabled managers to come close to the facilities and know the problems better. These managers are rotated and this enables them to face new

challenges. These six operation areas have performance indicators related to wastewater services and they compete amongst themselves to improve performance. Summarily, JW appears to have a strong leadership which sets performance targets for managers.

3) Corporate Culture

Johannesburg Water management has a mission of bringing expertise of private operation in order to build capacity within Johannesburg Water and make it sustainable. Johannesburg Water has a mission **“To provide all people of Johannesburg with access to a quality water and sanitation services”**. The mission is displayed in offices and to make people believe in the mission, Johannesburg water organizes street theatres. As the leading water utility in South Africa, JW has developed an Environmental Management System (EMS) that commits JW to the future sustainability of the environment when delivering water and sanitation services within the City of Johannesburg. The EMS focuses JW’s attention on environmental issues and brings them into the main stream of corporate decision-making.

The staff sensitizes the public about health and safety through street theatres. Through such theatres, the values and mission are communicated and this demonstrates that the utility should only serve better. Previously repairs and maintenance was contracted out, however, the need to create trust within the staff to maintain the infrastructure was a necessity. People were recruited and trained and the staff turnover is very low hence there is system of skill transfer. Hence a core group has been formed to serve in the provision of wastewater services.

Conclusively, JW, has a strong corporate culture which is mission oriented, besides, they have a developmental culture which they build by sensitizing the public, making it aware of the obligations for either party.

4) Customer Orientation

Customer surveys are carried out to establish people’s opinions concerning the functioning of the utility. This is done for both water and wastewater services annually. However, the result from the customer surveys cannot be correlated with level of services provided. Customers are very sensitive and have a tendency of comparing different service providers. Other service providers like Eskom, telephone companies which sponsor many activities in the communities will be rated high. Hence the results from customer surveys cannot be completely relied upon. Nonetheless the useful information is used to improve the services in wastewater provision. Customers don’t participate in decision making process but they can influence through the elected council.

Customers can get access to customers to the utility through phones, internet but mostly through the established call centre. The customer care centre has performance targets related to the numbers of call responded and consistently answered within less than 30 seconds.

Table 4.16 Indicators on Customer Orientation

| Indicators | JW |
|---|-----------|
| The utility is dependent on its customers for financing wastewater services | Yes |
| Does the utility conduct customer surveys | Yes |
| The utility has instruments to establish customers opinions regarding wastewater services | Yes |

| | |
|---|----------------------|
| The results from customers opinions are incorporated into operation of the utility | Yes |
| The utility has instruments (customer charters, customer contracts, etc) in place to arrange for rights of customers | No |
| The utility incorporates compensations payments in case it fails to meet its obligation | No |
| The utility has instruments in place and trains staff in dealing with customers for issues related to wastewater services | Yes |
| Customers are involved in decision making in the utility for issues related to wastewater services | Done through council |
| What percentage of complaints for wastewater is addressed | 80% |

In summary JW has a strong customer orientation with regards to wastewater services, irrespective of the outcome from customer surveys. The utility is dependant on payment of revenues to finance wastewater services and have trained staff to handle customers.

5) Commercial Orientation

To improve operational efficiency the following has been done;

- detailed assessment of the causes/origins of the overflows/spillages
- partial replacement of the non adequate traditional Roding technology through purchase and in house operation of Hydro Jetting Vacuum Tankers
- GIS mapping of the hot spot areas (high frequency/density of blockages) and establishment of an exhaustive preventative maintenance plan
- combining of hydro jetting cleaning and depot based cleaning programme completed through traditional Roding technique

A performance target of cleaning 17% of the sewer annually has been made and this is expected to reduce blockages.

There is no much marketing done, however some marketing is done through schools teaching about health and sanitation. Also national awareness campaigns are carried out but they are not necessarily marketing activities.

Cost reduction has been done through reduction of power and chemicals by optimizing the wastewater treatment processes. In some cases, enzymes have been used to reduce the use of chemicals the wastewater treatment process.

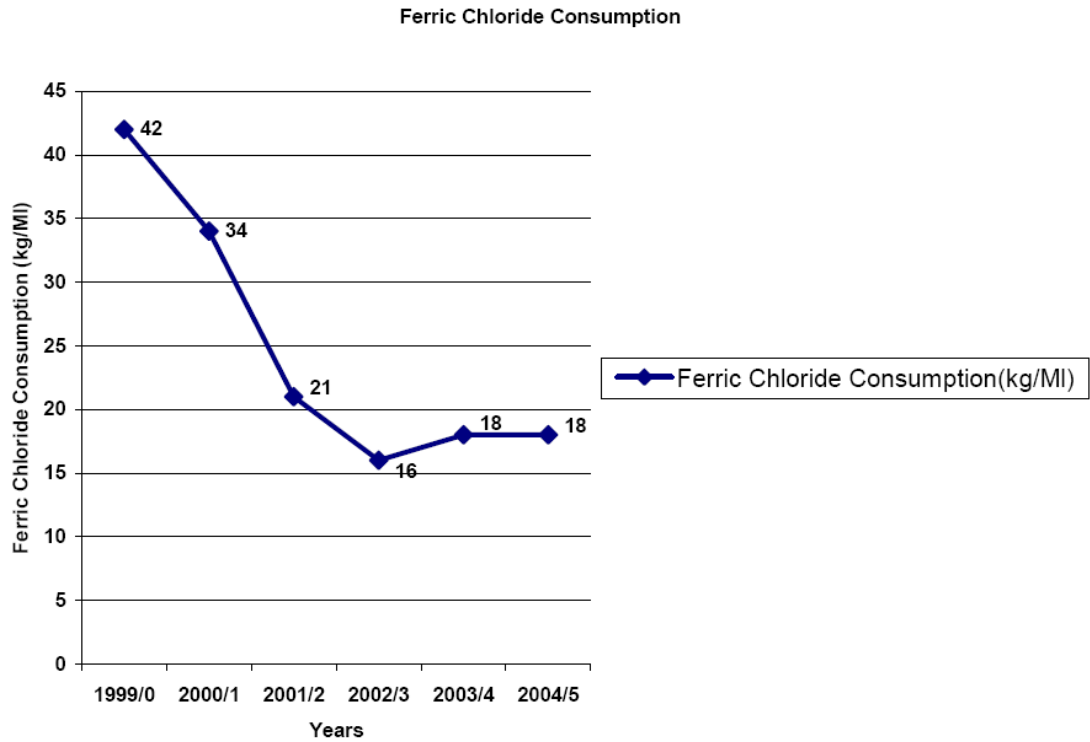


Figure 4-7 Reduction of chemical usage

Source: Management Contract between Johannesburg Water and JOWAM (2001-2006)

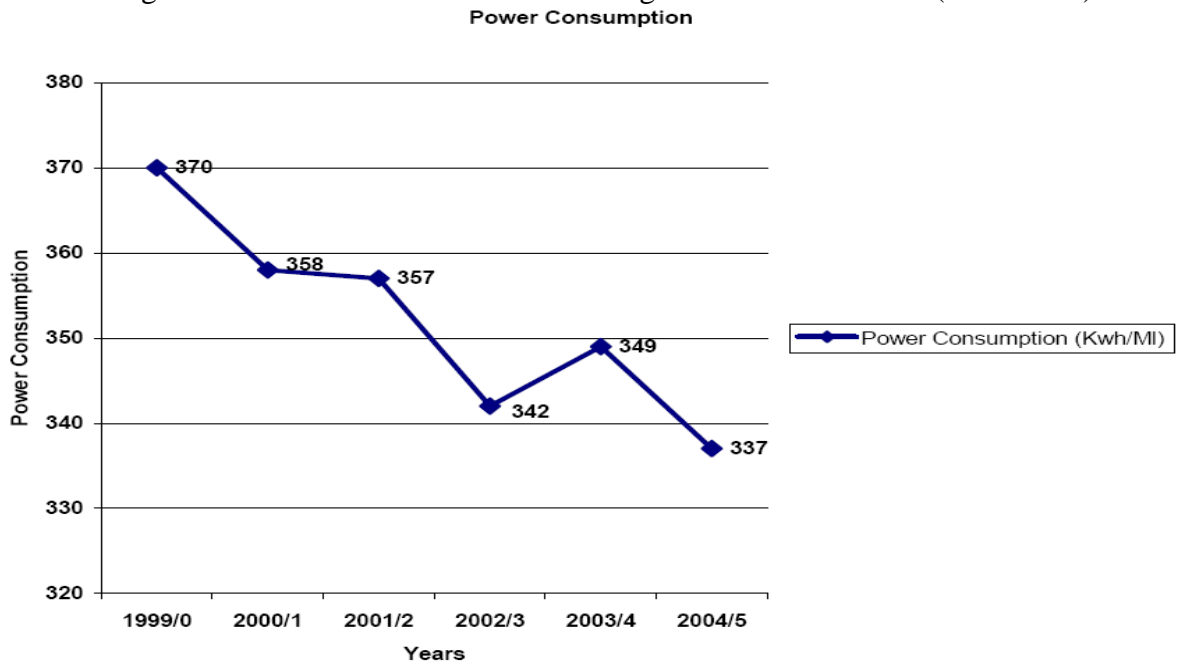


Figure 4-8 Power consumption reduction

Source: Management Contract between Johannesburg Water and JOWAM (2001-2006)

Other measures include:

- Building internal capacity and the implementation of a preventative maintenance plan, to reduce the number of breakdowns at the pump stations and reservoirs.

- Johannesburg water undertakes benchmarking with other institutions to compare performance between similar service providers. Benchmarking is done annually with national institutions for the 10 biggest cities in South Africa. A body for city water managers was created to undertake this exercise and the scope includes water and wastewater services.

The tariff for sanitation is not related to the actual cost for providing the services. The charges are payable by the occupier of any dwelling where service is provided in respect of land having a drainage installation thereon which is connected to Johannesburg Water's sewer: However, there is a new charge where meters were installed after 2001. The charge is a demand consumption based on increasing block tariff

Table 4.17 Tariff Structure for Johannesburg Water

| 1. Private dwelling house on a single plot, R/month | R/Month | US dollars/month |
|---|----------------|-------------------------|
| (a) Up to and including 300 m ² | 54.30 | 7.26 |
| (b) From 301 m ² to 1000 m ² | 105.70 | 14.13 |
| (c) From 1 001 m ² to 2 000 m ² | 159.90 | 21.37 |
| (d) Larger than 2 000 m ² | 230.40 | 30.80 |
| 2. Blocks of Flats: | 54.30 | 7.26 |
| 3. Deemed consumption area where a water meter has been installed after January 2001 | Rand | \$/month |
| (a) For the first 6 kl | Free | Free |
| (b) In excess of 6 kl up to 10kl | 1.90 | 0.25 |
| (c) In excess of 11kl up to 15kl | 2.20 | 0.29 |
| (d) In excess of 16kl up to 20kl | 3.50 | 0.47 |
| (e) In excess of 21kl up to 40kl | 4.90 | 0.65 |
| (f) In excess of 41kl up to 50kl | 5.90 | 0.79 |
| (g) In excess of 50kl | 1.90 | 0.25 |
| 4 Charges for Industrial Effluent | | |
| The charge is calculated in accordance with the concentration of the waste produced by the industry connected to the sewer network. | | |

6) Technical capacity

Johannesburg water has a decentralized system for its six operational areas. The areas are equipped with Engineers and technicians with experience. Each operational area is well equipped with Roding technology and Hydro Jetting Vacuum Tankers for sewer maintenance.

The area identifies major projects and these are executed centrally for example the Soweto Project to improve sanitation in the under privileged areas. The central has a capital investment department charged with the duty of capital works. Currently, Johannesburg party is implementing the Northern wastewater treatment works expansion capacity to provide first class wastewater treatment works to cater for the

present and future increase. The project is estimated to cost US\$60 million and is being implemented in phases, with the first phase expected to be completed by end 2008.

Johannesburg water has quality laboratory (central laboratory). This handles both the water and wastewater effluent quality. It also monitors industries since they are charged according to the level of pollution (concentration of the discharges from the industries). The treatment system used is the activated sludge systems.

7) Development of Human resources

There is a transparent procedure for hiring new staff and the procedure is followed and man power requirement are planned. Johannesburg water has improved the capacity of human resources in the wastewater department through training and development. In the past they used to hire out operation and maintenance of the sewer network activities, but the status quo changed and JW embarked on improving internal capacity to ensure quality and sustainability. JW compiles an annual workplace skills plan, identifying needs for all employees and focusing on it business objectives. Accordingly, wastewater training needs are identified and addressed. Training is carried out in house and with external institutions.

Table 4.18 Indicators on development of human resources

| Key Indicators on Development of human resources | JW |
|--|-----------|
| There is a transparent procedure for hiring staff | Yes |
| This procedure is followed | yes |
| Manpower required to work in wastewater services is planned | yes |
| There are performance indicators required for staff promotions | Yes |
| Staff salaries are comparable to the opportunities outside the utility | Yes |
| New staff go through a system of apprenticeship | Yes |
| You have a training programme for wastewater management | Yes |
| There is a system of knowledge transfer among staff | Yes |
| Total | |

JW demonstrates the need to develop human capacity as away of improving sanitation services.

8) Internal Accountability

The Board meets quarterly (every 3 months) as well as the three sub committees: Audit and Finance, HR and Remuneration, Operations and Procurement. The sub-committees as well as the board might meet more often if requested. Meetings between the Management of JW and the Board are on regular basis to monitor the performance standard. Corrective action is taken in-case of failure to meet s specifies standard, however, there are no direct punitive or rewards. Staff are required by top management to meet standard agreed upon; however, there are no direct rewards and penalties. Rewards and penalties are reflected in salary adjustments.

Table 4.19 Indicators of Internal Accountability

| Indicators | JW |
|---|-----------|
| How often does the utility management meet with the Board of Directors? | Monthly |
| Are there performance standard for wastewater required of the Managing Director by the Board of directors | Yes |
| Are their penalties and/or rewards applied to the Managing Director | No |

| Indicators | JW |
|--|-----------|
| by the Board of Directors for achieving specified performance targets? (for wastewater services) | |
| Are staff required to meet specific performance standards set by management? | Yes |
| Are penalties and rewards applied to staff by the management for achieving specified wastewater performance targets? | No |
| Staff is subjected to annual evaluations on the functioning in the utility? (yes/no) | Yes |

Conclusively, JW appear to have high levels of internal accountability administered through regular meeting with the BODs, notwithstanding the absence of direct punitive and rewards for performance.

9) External Accountability

Johannesburg Water reports quarterly to municipal council on the service targets set by a joint committee from JW and the city of Johannesburg. These quarterly meeting are meant to review performance and for corrective measures. The board reports to the Johannesburg’s mayoral committee on a set of performance standards monthly. Performance standards for service delivery are agreed upon by the Management of JW and city of Johannesburg. These targets are monitored quarterly. There are no rewards or penalties attached to these targets.

The Department of Water Affairs and Forestry is the regulatory authority for wastewater standards. The current government policy is development rather than punitive. Accordingly, JW is expected to meet standards which are revised towards achieving national standards.

JW does not take loans from commercial markets, financing is basically from revenues obtained from services provided and grants from municipal council. However, JW reports to the city of Johannesburg’s Mayoral Committee on the financial standing of the utility.

Table 4.20 Indicators of external accountability

| Key Indicators | JW |
|---|--|
| Does the utility have to meet specified performance indicators (standards) for wastewater services? | Yes |
| Have these standards been monitored | Yes |
| If yes, is the utility subjected to penalties and/or rewards to ensure compliance?) | Role is development rather than punitive |
| Have penalties and/or sanctions been applied | No |
| Does the utility produce annual reports clearly showing the achievement in wastewater | Yes |
| Are external groups represented in advisory or board of directors’ body? (NGO’s, customer groups, government, financing institutions) | Not necessarily |
| Has the utility secured any loans from lending agencies to undertake wastewater activities? | no |
| If yes, do the loans require achievement of some performance indicators? | no |

JW does reflect relatively strong external accountability. There quarterly meeting between the management of JW and the mayoral committee for corrective measures where there is deviation. The quarterly meetings between the contracting parties to review provide a strong mechanism for performance management leaving little room for deviation. However, despite the existence of performance standards there are no direct rewards and penalties for achieving these targets.

10) Interaction with External Institutions

The ministry of water and forestry does not play a very big; the major player is the city of Johannesburg who is the only shareholder. The government though has influence through giving national grants but it done through the City council of Johannesburg. Since there is no donor funding in Johannesburg water, donors have little influence. However, the World Bank funded the Soweto sanitation project and the requirement was to improve access to sanitation to the under privileged.

Non Governmental Organization have some influence through the political side however, there is no formal interaction with NGOs. Again save for the Soweto sanitation project where the NGOs came in to demand for sanitation improvement in that area there are no instances where they influence the decisions of the utility.

Unions are very powerful in South Africa; Johannesburg Water holds regular meetings with them on issues of safety, work conditions. Unions show the need to create Johannesburg Water and they were very supportive since it was aimed at improving capacity of workers and service provision.

4.3.4 Conclusions

The following is a summary of the performance for JW

- The JW has high sewerage coverage at approximately 90% for all areas under its operation.
- It is characterized with high investments in sewer extensions and infrastructure.
- The quality of the effluent from the treatment plants up 98% of effluent standards.
- JW has good response time to customer complaints and clearing overflows within 24 hours.

Why

- JW has Autonomy in operationalization and pursuit of utilities mission. It has a strong financial autonomy where it can finance operations and maintenance of wastewater infrastructure.
- Strong organization culture linked to the mission
- Rather than having stringent wastewater standards which will not be monitored and achieved, SA has a development policy which requires JW to work towards achieving the National Standards.
- As the leading water utility in South Africa, JW has developed an Environmental Management System (EMS) that commits JW to the future sustainability of the environment when delivering water and sanitation services within the City of Johannesburg. The EMS focuses JW's attention on environmental issues and brings them into the main stream of corporate decision-making.
- JW has appears to have a strong leadership, setting goals and objective for the managers.

- JW recognizes the need for human resources development and implementation of skills transfer and training is one of the factors managers is assessed.
- JW represents a case of a strong external accountability albeit no punitive and/or direct rewards for performance exist. This is through performance management with the quarterly meetings to review targets.

5 Discussions

5.1 General

This Chapter links the findings in chapter four with those of other studies and the theoretical concepts. The findings are discussed in light of the objective for the study and the research questions developed in chapter one. The chapter also tries to discuss how the findings might have been affected by the methods of study used.

5.2 Performance of Utilities

This study delved on factors that contribute to performance of utilities with respect to wastewater services. In this study, the research tried to measure performance of utilities providing wastewater services but did not give it a detailed emphasis on performance benchmarking. Organization performance is hard to measure in public sector. The concept of organizational performance refers to whether the agency does well in discharging the administrative and operational performance functions pursuit to the mission and whether the agency actually produces actions and outputs pursuant to the mission or institutional mandate (Kim, 2005). Tynan and Kingdom (2002) proposes categories for performance measurement of utilities providing water and sanitation services, however, these categories are inclined to water supply services. This study focused on six indicators shown in the table 5.1.

Table 5.1 Table comparing showing performance of NWSC and JW

| Category | NWSC | JW |
|--------------------------------------|--|---|
| Sewerage Coverage | 7% | 90% |
| Investment in wastewater | Low investments | High investments |
| Effluent Quality | Most of the treatment plants not meeting standards | Effluent from the treatment plants up 98% of effluent standards |
| Response time to customer complaints | Less than 24 hours | Less than 24 hours |
| Response times to sewer over flows | Average of 5 hours | Less than 24 hours |
| Technologies Used | Conventional and waster stabilization ponds | Activated sludge systems |

NWSC attributed to low coverage and investments to the unwillingness of premises to connect to the sewer since they already has on-site sanitation system. Another reason advanced was financing sewer extensions is very expensive. The question is how these performance indicators of the utilities relate to the theoretical factors that contribute to good performance of agencies? This is discussed in proceeding sections.

5.3 Relationship between performance and causal factors

5.3.1 Organization Autonomy

According to the analysis the NWSC was found to be with high level of autonomy. The analysis revealed that the NWSC has high level of managerial, structural, policy and financial autonomy, makes its own budget, prioritizes where to spend and not. However, there was no correlation that the level of autonomy of the NWSC led to effective wastewater services provision. The case of Johannesburg Water appears to have relatively high level of autonomy. The expectation that high levels of autonomy would translate into effective performance of utilities providing wastewater services is falsified. The findings are in line with Rainey and Steinbauer, (1999) who argued that government agencies will be more effective when they have high levels autonomy in relation to the external stakeholders, but not extremely high levels of autonomy. Hypothetically, it would be expected for the utilities with high degree of autonomy to have better performance in wastewater services provision.

5.3.2 Organization Culture

According to the analysis NWSC was found to have a strong organization culture. This strong mission oriented culture does not arguer with the performance levels for wastewater services provision. JW appeared to have a strong corporate culture which is mission oriented, besides, they have a developmental culture which they build by sensitizing the public. Both cases have a strong mission, the difference being that JW mission is development oriented. According to (Moynihan and Pandey, 2004) previous work has emphasized the importance of designing mission oriented culture, they argued that culture does not matter to performance but development culture are likely to achieve significant higher levels of effectiveness. The findings from this research are consistent with the proposition that utilities with high organization culture, linked to mission will achieve high level of effectiveness with respect to sanitation services.

5.3.3 Leadership

The analysis of leadership in NWSC revealed that top management was not giving a lot of commitment towards wastewater services provision. According to the survey, most respondent said that the level of commitment and priority given to water supply were not comparable to that of wastewater services. The case of JW, leadership JW has demonstrated their commitment in the strategies they formulate e.g. development of an Environmental Management System (EMS) that commits JW to the future sustainability of the environment when delivering water and sanitation services within the City of Johannesburg.

The findings from this research suggest that the level of performance of utilities with respect to wastewater services will be reflected in the level of commitment top management provides. It is argued that the question over whether top-level leadership significantly affects organizational performance can be clarified by properly interpreting the results of executive succession studies that have used economic aspects of organizational performance as criteria. When several methodological concerns are addressed, it is evident that executive leadership can explain as much as 45% of an organization's performance (Day and Lord, 1988). According to Rainey and Steinbaur, (1999) the more effective the leadership of the agency, the more effective the agency. Comparing the level of service provision as per the indicators in table 5.1 appears to be in agreement with the supposition; that leadership determine performance.

5.3.4 Customer Orientation

JW showed some degree of customer orientation with regards to wastewater services, irrespective of the outcome from customer surveys which would rank it lower than other service providers. Similarly NWSC showed some degree of customer orientation. But in both cases it is not clear whether a greater customer orientation results into better wastewater services provision. For the case of JW the outcome of customer surveys could not be relied upon and customer were not involved in decision making of the utility.

There is no evidence that a strong customer orientation will inevitably influence the performance of utilities providing wastewater services. The interaction between the utility and the customers seems to be collaborative in a sense that the utility solves the immediate problem of the customer and the customer will in turn have a good image of the utility. The interface between the customers in the case of NWSC is when they have complaints with overflows and when they probably need connections and payment of bills. The payment of the bill is together with that of water and there many forms e.g. through a direct debit with the bank, at NWSC cashier offices and bank transfers. Baiette et al., (2006), argued that well-performing utilities become more appreciative of consumers interests and needs. In his studies just like in the above cases, the information collected from surveys was not often used in decision making.

5.3.5 Commercial Orientation

Analysis revealed that provision of wastewater services by NWSC are commerciality driven hence NWSC has a strong commercial orientation with respect to wastewater services, undertaking actions to improve operational efficiency and cost reduction measures. Also the reward and penalty scheme for the NWSC has a greater component on return of capital employed. See reward and penalty structure in appendix 4. Return on Capital Employed (ROCE) is used in finance as a measure of the returns that a company realize from its capital employed. The ratio can also be seen as representing the efficiency with which capital is being utilised to generate revenue. It is commonly used as a measure for assessing whether a business generates enough returns to pay for its cost of capital. Return on investments in wastewater facilities take many years and in a business perspective, it does not make sense initially. This seems to be one of the big factors inhibiting the NWSC to allocate funds to wastewater services as this would distort the whole incentive/penalty arrangement.

JW has under taken commercial orientation activities by reducing chemical use in wastewater treatment and introducing enzymes and optimizing the wastewater treatment processes to reduce power usage. However, actions like operating efficiency and reduction of cost within a utilities signal good performance but cannot show a wider picture on wastewater services provision. These actions my reduce costs of the utility but how does this translate into improved services. Cullivan et al., (1988) argued that performance of institution's functions should be guided and disciplined by a strategy to achieve financial self sufficiency at an appropriate stage of growth. The findings from this research asserts that the idea is indeed good but inhibits investments in wastewater facilities that have high initial cost and long pay back periods.

5.3.6 Technical Capacity

According to the analysis, JW appears to have a strong technical a capacity both in personnel and equipment to undertake technical activities. Each of the six operational

zones is equipped with a motorised jetting machine and Roding equipments. From the analysis of the technical capacity of NWSC, it appears NWSC has the required staff but lack the empowerment in terms of finance and equipment to execute technical activities. Technical work in both NWSC and JW is performed directly by skilled staff but outside specialist whose work is supervised by the utility's staff are used for big projects. The research indicates that technical capacity of the utility is a strong factor that contributes to good performance of utilities with respect to wastewater services. The findings are in agreement with those of Cullivan et al., (1988) who defined technical capability as the measures of the institution's competence in conducting the technical work required to carry out the responsibilities of the institution. He seemed to imply that there is a correlation between the levels of technical capability the level of performance of institutions.

5.3.7 Human Resources Development

Data analysis showed that JW has invested heavily in human resources development to improve internal capacity to ensure quality and sustainability. JW compiles an annual workplace skills plan to identify the gaps and train staff accordingly. The NWSC presents a case where staff training for sewerage staff is not directed at specific problems within the wastewater department. The findings from this study echo those of Brewer and Selden, (2000) who argued that efforts to build human capital and retain high performing human capital have a positive relationship with performance. The black-box theory also argued that capacity of human resources management systems would have an impact on performance (Moynihan and Pandey, 2004). This research asserts that performance of utilities with respect to sanitation services will be mirrored on the level of human resources development a given utility has.

5.3.8 Internal Accountability

NWSC showed high levels of internal accountability on the part staff for results, with incentives pegged to performance targets for the different department. This is reflected in the reduced responses times to customer complaints and clearing of sewer overflows. Similarly, there is an indication that JW has some degree of internal accountability where the Board meets with management regularly to review performance. The findings of this research asserts that where internal accountability is enhanced either through a system of periodical review of set targets or through targets that are reward based will improve wastewater service provision. This is in line with the studies of Baiette et al., (2006) who highlighted that where accountability and autonomy within a utility are enhanced, often leads to improving performance.

5.3.9 External Accountability

JW does reflect relatively strong external accountability with quarterly meeting between the management of JW and the mayoral committee for corrective measures. Rather than taking punitive actions when result deviate from targets, they take corrective measure periodically. On the other hand, NWSC showed low levels of external accountability with respect to wastewater services. There are no penalties or rewards for targets of wastewater services. Naturally, the agency will focus on issues that will attract rewards and put less emphasis on those activities that are blurred in the contract. The contract between the NWSC and government does not clearly specify the requirement of either party with respect to sanitation services. Consequently, performance of the utility is not measured with respect to wastewater services provision.

The findings from both cases seem to suggest that external accountability to the stakeholders will influence performance levels. However, the owner and/or stakeholders should specify clearly the expectations from the utility i.e. performance targets, financial objectives, regulations and monitoring service and quality standards etc.

5.3.10 Interaction with Key External Institutions

The case of JW government through the municipality contributes towards financing of wastewater capital works. Despite the fact that JW does not take loans, the WB has financed sanitation improvement in the Soweto Zone. The case of NWSC, donor financed the Kampala Sanitation master plan study and now they are in the phase of implementation. Previously through the good working relationship with the donors, they have provided funding to the argumentation of water supply and network improvement among other activities. The government through the ministry provides counterpart funding. Also, the government through the ministry of water and environment has accorded to NWSC working environment to implement the reform processes for performance improvement.

External institutions in particular the government which provides the political atmosphere and finances through budget allocation and the donors willing to provide loans influence greatly the level of wastewater services provision. All this has been achieved through the good working relationship that has been built overtime. The findings from this research are in conformity with those of Cullivan et al., (1988) who asserted that effective organizations have the ability to influence and adopt to external entities. In the study, they argued that external environment affects the performance of water/wastewater institutions by providing a good working environment, finances and regulations.

5.4 Regulation

Analysis revealed a very strong regulation for the case of NWSC. There standards NWSC must adhere in executing duties of wastewater services. There stringent effluent standards set by the NEMA and the DWRD is supposed to monitor compliance and apply punitive measures for non compliance. Further analysis revealed lack of enforcement of the regulation, which the regulators (NEMA and DWRD) attributed to lack of capacity and facilitation to undertake the regular monitoring exercises. The case of JW revealed that instead of taking a hard stance, the have adopted a development policy. This policy allows the operators to improve effluent standards towards achieving National and Internal standards for effluent discharge. A strong regulation that cannot be enforced appears to be one of the factors that have repressed improvement of wastewater services.

6 Conclusions and Recommendations

In this chapter, generalizations have been made regarding performance of utilities with emphasis on wastewater services. The objective of the study was to identify the factors that contribute to good performance of utilities with respect to wastewater services provision. In this chapter a summary is given following the discussions in chapter 5. The chapter makes recommendation on improvement of wastewater service provision by utilities. It also gives a hint on areas for further research and investigations

6.1 Conclusions

The research objective was to address the knowledge gap in institutional arrangement and management of sanitation services by undertaking a comparative analysis of different cases; to get a better understanding of the factors that contribute to good performance by utilities with respect to wastewater services. A number of theoretical contributions and practical implications can be derived from the results. The analysis of the cases inline with the theoretical factors has revealed that to have good performance;

1. A sufficient level of autonomy is required; high level of autonomy may hinder performance of utilities providing wastewater services. The functions of these utilities should be regulated with a development policy not a repressive policy which cannot be monitored adequately. The utility should have sufficient financial resources for operational and maintenance and financing capital expenditures. These funds can be generated from charges or from government subsidies and donor funding.
2. A leadership that is committed to the mission; mere writing the mission is not sufficient. The findings from this research suggest that the level of performance of utilities with respect to wastewater services will be reflected in the level of commitment top management provides. It is argued that top-level leadership significantly affects utilities performance with respect to wastewater services provision. Leaders are charged with goal setting, effective administration and political coping.
3. A strong mechanism of accountability to external stakeholders; the form of accountability does not necessarily have to be punitive in sense that when a utility deviates from targets, it is punished. The JW provides an empirical case where a system of quarterly reviews of results amounts external accountability. This keeps both the regulator and the operator tracking performance using a system of result based performance (RBM). RBM can help to instill more of a "performance culture". It increases the commitment to information management as well as program learning and is useful for predicting, verifying and demonstrating results which, among other things, can help to demonstrate the value of development cooperation. On the other hand too much time and energy may be spent on measurement of 'results' and not enough ensuring ownership and commitment (Morgan and Qualman, 1996). They agree that cause and effect are often difficult to trace, particularly in complex processes of institutional change hence, accountability can be problematic and concerns remain with the application of RBM techniques.
4. A good relation with external institutions will significantly affect the level of performance of utilities providing wastewater services. These external institutions can be the donors and the government which provide the necessary finances to execute major projects that cannot be financed from charges emanating from wastewater services provision. The government further provides the political environment under which these utilities operate through policy formulation.
5. Internal accountability of result is of paramount in the internal functioning of the utility. Staff learn how to respond better to the requirements and obligations

through a system of rewards. NWSC provides case where a system of incentives has improved level of service provision to the customers. Internal accountability allows individual staff to account for performance where clear goals and objectives are set.

6. Development of human resource and retaining the most competent staff is another critical factor that contributes to good performance. Nonetheless, the staff have to be facilitated to conduct their duties. This finding is consistent with Liu et al., (2007) who tried to resolve a long-standing and controversial question on whether human resource management matter for organizational performance based on data from over 19,000 organizations and concluded that human resource management adds significant value for organizations performance.

6.2 Significance of the Study

This research was to address the knowledge gap described in the problem statement in section 1.2. To date most of the empirical research has focussed on the performance of water and sanitation utilities by describing the characteristics of well performing water utilities. But most of the information given is not symmetrical between water and waster services provision. From the theoretical perspective, this research highlights the factors that are likely to contribute to good performance of utilities but with the emphasis on wastewater services.

6.3 Recommendations

- 1) The study recommends that performance contract between the Government of Uganda and the NWSC should be reviewed to reflect quantified indicators for wastewater services. The current contract is comprehensive on many aspects to do with water supply and sewerage services remain in obscurity. There are qualitative indicators and because of this they are easily forgotten.
- 2) The reward and penalty structure for NWSC, which is currently skewed towards to water services provision should be revised to include quantified performance targets for wastewater. The performance targets therein should reflect achievement quality and service standards, and investment executed in wastewater services. This will increase the accountability and the emphasis management accords to wastewater services provision. Accordingly, for utilities that chose a reward and punitive mechanism should always include targets for sewerage services provision.
- 3) The analysis revealed a very weak regulatory framework for sewerage services provision one of the key factors that affect performance. The current framework should be revised to separate the operating and regulatory functions. The biggest problem was on capacity to implement the regulations. The current regulatory framework should be reviewed and facilitation of the regulatory body to monitor performance should be the responsibility of the utility.

- 4) Revenue generated from sewerage services should be reflected and separated from that of water monthly. The monthly collections should show what proportion belongs to sewerage and the surcharge for sewerage. This will sidestep the notion that revenue generated from sewerage charges is being used to subsidize water supply systems. The dichotomy of the collection between water and sewerage will ensure proportionate revenue is reinvested in the sewerage system.
- 5) The study recommends that utilities providing wastewater services create a dedicated sewerage department at head office to ensure implementation and achievement of activities under the sewerage services. The department should be natured with the view of it achieving the same status utilities accord to water supply.
- 6) The utility has qualified and experienced technical staff, but there is need for improvement in development of human resources in the wastewater department to cope new challenges that come along with economic development.
- 7) Regulation and effective regulation framework will become increasingly important in the future, whatever mode of management and operation will be selected. The transition from centrally managed state organizations to decentralized public and/or private operated services is difficult for many developing countries (Seppala, 2002). Along those lines, the regulatory framework for wastewater services needed to be revised and strengthened and the regulatory capacity should be built. However, the regulation should be lenient and feasible since currently developing countries cannot afford a heavy over-regulated system. A case of Johannesburg where different wastewater treatment plants have different discharge standards but all in the direction of achieving the national standards.

6.4 Future Studies

- 1) This study delved on factors that contribute to performance of utilities with respect to wastewater services. In this study, the research tried to measure performance of utilities providing wastewater services but did not give it a detailed emphasis. Organization performance is hard to measure in public sector. The concept of organizational performance refers to whether the agency does well in discharging the administrative and operational performance functions pursuit to the mission and whether the agency actually produces actions and outputs pursuant to the mission or institutional mandate (Kim, 2005). Tynan and Kingdom (2002) proposes categories for performance measurement of utilities providing water and sanitation services, however, these categories are inclined to water supply services. A study is proposed to develop key indicators and to measure performance of utilities providing wastewater services
- 2) The manager of JW claimed that wastewater services provision subsidises water supply. There was similar finding in the case of NWSC where by approximately 10% of the funds generated from wastewater services were being reinvested into the system. Yet most of these managers claimed that there was no cost recovery. The actual cost for providing sewerage services is not very clear. Further studies

are recommended to ascertain the cost of providing sewerage services and this will illuminate on the level of cost recovery particularly for wastewater services provision. In his studies, (Paterson *et al.*, 2007) cited (WHO and UNICEF, 2000) where the average cost for construction different modes of wastewater services provision were computed for developing and semi-developed nations. These can be verified and the cost for O&M computed. These coupled together and in relation to the revenues obtained will assist in finding the cost recovery level.

- 3) Private sector management of faecal sludge against public sector management: The case for Kampala-Uganda and Johannesburg-South Africa. During this study it was noted that for the case for Uganda, desludging of septic tanks and pit latrines is carried out by private cesspool operators, and for the case of Johannesburg-South Africa, Johannesburg water carries out this functions. The study can also check the possibility of a sewerage surcharge where buy septic tanks are emptied by the wastewater services providing entity at no extra cost when they get filled up. This study would provide experiences in desludging management.
- 4) Further studies are recommended to investigate the relationship between the regulation, enforcement and the contribution of different stakeholders in wastewater services provision for urban communities. What is the level of contribution to the delivery of wastewater services from utilities, regulators, financier and non governmental organization? How does this level relate to the current regulations?
- 5) As aforementioned, this research merely identified the critical factors but has not explained the interrelationships that exist amongst these factors. Certainly in way one or the other the factors described above are commutative; one factor affects the other and conversely so. A study on the relationship and impact of the different critical factors that has been identified in this study is recommended.

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Appendix

Analytical Framework

A1.1 Organizational Autonomy

A1.1.1 Policy Autonomy

Aspects of this responsibility that will be dealt with include:

- Which organization is responsible for setting quality standards wastewater treatment?
- What are the standards for wastewater treatment with which the utility must comply?
- Which organization is responsible for setting service standards to which the utility must adhere?
- What service standards are specified?
- Which organization is responsible for determining the institutional setup sanitation sector?

The organizations responsible for formulating these policies determine the policy framework within which the utility is to operate.

A1.1.2 Regulation

The term *regulation*, as it is used here, in essence relates to enforcing regulations that have been formulated by the organizations responsible for policy formulation. The case studies respond to the following questions:

- What organization is responsible for ensuring that the utility meets the standards for wastewater discharge?
- What organization is responsible for ensuring that the service standards for provision of services have been met?
- Which organization is responsible for economic regulation of the utility?
- Does deviation from the standards result into some form of penalty, intervention from government etc?

A1.1.3 The Legal Autonomy of the Utility

- What type of organization is the utility? (Description of the legal status of the utility)
- Which organization owns the utility?
- What is the general governance structure of the utility as specified by laws and statutes?
- What are the responsibilities of the utility, and to what criteria must the utility adhere (for Example, financial self-sustainability) as defined by law and statutes?

A1.1.4 Financial Autonomy (Resources)

- How is the provision of wastewater services funded?
- If the funding of wastewater services is partly done by the utility to what level is this?

- Who cover the deficit? From what sources does the utility have access to financial resources?
- Is the availability of financial resources sufficient for provision of sanitation?
- What is the procedure used for establishing tariffs for wastewater by the utility?
- How do they relate to the service provided?

A1.2 Leadership

Aspects of this dimension include having and understanding the mission, understanding of leadership, sufficient technical knowledge to inspire, identification of performance standards giving positive and negative feedbacks and guidance to technical staff.

- What do facilities of wastewater look like?
- What does the word leadership mean and how well does leadership work as you define it?
- Are there any leaders like that here?
- What positive impact does leadership have on the way you work? Examples? Negative impacts? Examples? Do leaders get out in the field? How often?
- What do the leaders do to inspire others?
- Do leaders get out in the field? How often?
- What role does the leadership of the organization play in selecting the technology use in your job?

A1.3 Corporate culture

Aspects of this dimension include having and understanding the mission, history and identification of functions of the utility among others:

- What is the organization's mission?
- How do you find out about the mission and changes in it?
- What helps people believe in the mission?
- Organizational chart clearly delineating wastewater services;
- Description of the functional differentiation within the organization and the deployment of staff over the different functions;
- Continuity in the organization culture;
- Tell me about the history of the institution?
- What do people expect from each other around here in terms of carrying out duties related to wastewater services?
- Has the organization had a constant core group of people over years? If so who are they?
- What is the staff annual turnover?

A1.4 Consumer orientation

To assess to what extent a utility has adopted a consumer orientation, the following aspects are to be investigated:

- To what extent is the utility dependent on its customers for financing wastewater services?
- Are any instruments or practices used to establish what customers' opinions are concerning the functioning of the utility (for example, customer surveys, customer councils, focus groups, customer interviews, and so on)?
- How are these results incorporated into the operation of the utility?

- Are any instruments in place that arrange for rights of the customers (for example, customer charters, customer contracts, and so on)?
- Do these arrangements also incorporate compensation payments in case the utility fails to meet its obligations?
- Are any instruments or practices in place to train employees of the utility in dealing with customers?
- What are the ways in which customers can get access to the utility (phone, in person, Internet, and so on)?
- To what extent are customers involved in decision making in the utility (suggestion boxes, customer councils, and so on)?
- What have been the number and nature of complaints over the past years?
- Has the number increased or decreased?
- Has the nature of the complaints changed?
- How does the utility use the information generated by the complaints?

A1.5 Commercial orientation

The aspects included are cost effectiveness, operating efficiency and the extent to which actions of the utility are directed towards financial sustenance.

A1.5.1 Operating Efficiency

- What measures are in place for improving operational efficiency in wastewater services provision?
- Are there performance targets that have been set to reflect operation efficiency in wastewater services?
- Are there targets to improve staff productivity?
- How is the tariff structure for wastewater determined?
- To what extent are consumer's perceptions about the services they receive and their ability and willingness to pay taken into account?
- What is the relationship of cost of services to the tariff for wastewater? (degree of cost recovery)
- Are there are marketing activities for wastewater services to ensure that consumers pay their bills? Examples?
- What is the billing/collection relationship (collection periods)?

A1.5.2 Cost Reduction

- What are the cost reduction measure the utility employees?
- Does the utility undertake benchmarking particularly for wastewater services as a measure of cost reduction?
- If so what are the nature and scope of the benchmarking activities that the utility implements related to wastewater services?
- What is the frequency of these exercises?
- Are the outcomes of these exercises translated into strategic and operational policy?

A1.6 Technical Capacity

Issues to be assessed include competence in conducting the technical work both experience and qualification of human resources and availability of equipments:

A1.6.1 Planning

- Who makes technical decisions?

- What are the qualifications and experience of technical decision-makers?
- What examples are available for successful decision making?

A1.6.2 Quality Control of the end product or technical operations related to wastewater.

- Who is responsible for quality control, his/her qualifications and experience?
- Do you have sufficient and appropriate equipment to ensure quality work?

Examples

A1.6.3 Completion of projects

- Tell me about the new projects (new or rehabilitated works) undertaken in the past few years?
- Do you have sufficient and qualified staff to undertake these projects?
- Is there sufficient and quality equipment to execute these projects?

A1.6.4 Completion of technical tasks

- Do you have sufficient and qualified staff to undertake technical tasks?
- Is there sufficient and quality equipment to carry out technical tasks?

A1.6.5 Adaptability of suitable technology

- What technologies are used (e.g. treatment process, instrumentation, energy system) in wastewater services?
- What skills are available for the technologies?
- Is there enough equipment and spare parts for the technology employed?

A1.6.6 Research and Development

- Do you have sufficient and qualified staff to undertake research particularly in wastewater services?
- Is there enough equipment to conduct research and experimentations?
- Is there a budget allocation devoted to research?
- What research could you have carried out in the recent past on wastewater services provision?

A1.6.7 Managerial Capacity

- Does the utility have qualified and experienced managerial staff in the wastewater services department?
- What are the qualifications and experiences of the staff in wastewater services department?

A1.7 Development of human resources

Wage and labor problems are recurrent difficulties in public sector utilities. Excess staff and low labor productivity characterize many a public utility. In the category of human resources management, information should be included regarding the level at which the following decisions are made:

A1.7.1 Hiring and firing of individual staff members

- How are staff hired?
- What is the system for taking on new staff?
- What is the mechanism for planning manpower needs for wastewater provision?

A1.7.2 Promotion and demotion of individual staff members

- What is the basis of promoting staff who serve the utility under the wastewater division?
- What are the performance indicators required for staff promotions?

A1.7.3 Determination of the salary and incentive structure of employees

- How do staff salaries compare with opportunities outside?

- What benefits are available and do they make a difference in comparison with salaries paid elsewhere?

A1.7.4 Skill transfer training programs

- How do new staff learn to do their job? How did you?
- How do you (as a manager, training officer) determine what staff needs to know about training in wastewater services?
- Tell me what happens in typical training program for wastewater services if you have conducted any? Is the programme specifically aimed at wastewater services or is it more general (including water supply)?
- If employees attend a course outside the institution, is there anyway they teach others what they have learned?

A1.8 External accountability

A1.8.1 Accountability to Government

- Does the government require the utility to meet specific performance indicators (standards) for wastewater?
- If so, what are these performance standards for wastewater services?
- What measures are in place to make the utility achieve the required standards? e.g. penalties, rewards etc.
- To what extent have measures allowed by the government been implemented by the government?

A1.8.2 Accountability to Regulator

Quality

- Does the regulator require the utility to meet specific quality standards for wastewater?
- What are these quality standards for wastewater?
- What are the measures (penalties and rewards) that this organization has to ensure that the utility complies with these standards?
- To what extent has the regulator applied these measures to the utility?

Service Standards

- Does the regulator require the utility to meet specific service standards in regards to wastewater?
- What are these service standards?
- What are the measures (penalties and rewards) that this organization has to ensure that the utility complies with these standards?
- To what extent has the regulator applied these measures to the utility?

Investment requirements

- Is the utility subject to minimum investment requirements for wastewater?
- If so, what are these requirements, and what is the procedure that determines these requirements?
- What are the measures that can be taken to ensure that the utility complies with these standards?
- To what extent have these measures been applied?

A1.8.3 Accountability Financial Institutions (wastewater services)

- What are the performance indicators the utility must adhere to in order to satisfy the institutions that have provided loans or grants to the utility?

- Do the loans/grants tied to specific performance indicators
- What are the measures that the financial institutions can take when the utility has not met these requirements?
- To what extent has the application of such measures occurred?

A1.8.4 Customer Organizations

- Is there a formal customer organization that represents the interests of the consumers?
- If so, what are the powers of this organization?
- To what extent are these powers used?
- Are customers in any other (formal) way involved in the functioning of the utility?
- Does the utility publicly report on its performance?

A1.9 Internal accountability of results

Assessing the internal accountability for results will be done by investigating two accountability relationships. These are relationships between the utility and the board of directors and accountability within the utility providing wastewater services.

A1.9.1 Between Board of Directors and Utility

- What are the performance standards for wastewater that the utility must adhere to?
- Does the Board of Directors provide clear and measurable targets that must be achieved by the service provider?
- What are possible measures that the Board of Directors can take when the utility does not achieve the agreed upon performance targets for wastewater?
- Have these measures ever been used?
- Can the Board of Directors reward the management of the utility for achieving performance standards?
- If so, how, and how frequently are these rewards used?

A1.9.2 Within Utility (staff Accountability)

- How is the performance of the employees evaluated?
- To what extent are the accountability mechanisms based on procedural accountability and to what extent on the achievement of performance targets?
- Does the utility use (internal) performance contracts (either personnel contracts or contracts between departments)?
- If performance is evaluated against set performance targets, what measures are available to punish or reward the employee for failing to achieve or succeeding in achieving the performance targets?
- How does that system of penalties and rewards work?
- How often are penalties imposed?
- How often are rewards applied?

A1.10 Interaction with key external institutions

Knowledge on update information about policy, finance and regulatory, strategies used to influence external entities and contact with key individuals in external entities. Political commitment toward provision of sanitation services.

A1.10.1 Parent Ministry

- What is the nature of political support and commitment to the utility in respect to sanitation?

- How is the working relationship between the parent ministry and the utility with respect to wastewater services?
- Has the utility received government support for increase of tariff over the past years?

A1.10.2 Municipality

- What is the influence of municipality to the utility on the delivery of wastewater services?
- How is the working relationship between the municipality and the utility?
- What role does the municipality play in wastewater services provision?

A1.10.3 Donor

- What is the influence of donors to the utility on the delivery of wastewater services?
- How is the working relationship between the donors and the utility?
- What role do the donors play in wastewater services provision?

A1.10.4 Nongovernmental Special Interest Groups

- Are there any nongovernmental special interest groups that have involved themselves with the functioning of the utility?
- What has been the nature and influence of their involvement to the utility with respect to wastewater services?
- What is the working relationship between the nongovernmental organizations and the utility?

A1.10.5 Union

- What is the influence of the union on the utility?
- What is the working relationship between the union and the utility?

A1.11.1 Performance

Ultimately, the decisions made by the various actors and the resulting implementation of these decisions will lead to a certain performance. Indicators (preferably over a long time series) of this performance that could be included in the case studies are discussed below.

A1.11.2 Financial Indicators

Financial indicators that preferably should be included:

- Unit operational cost
- Average tariff for wastewater collection
- Total revenues per population served
- Residential fixed charge
- Ratio of industrial to residential charges
- Connection charge
- Contracted-out service costs as a proportion of operational costs
- Investments

A1.11.3 Operational Indicators

Operational indicators that preferably should be included:

- sewerage coverage
- number of connections
- composition of users (connection)
- number of people served
- length of sewer system
- treatment of sewerage (technologies used, volume treated)
- sewerage blockages.

A1.11.4 Personnel Indicators

Indicators relating to human resources management that preferably should be included:

- annual training budget per staff.

Experience and qualification of staff employed in different managerial capacities in the wastewater department.

A1.11.5 Customer Management Indicators

Performance indicators relating to customer management that preferably should be included:

- percentage of budget spent on customer management
- annual number of complaints
- response time to complaints

Appendix ii: Survey for collecting information of key indicators

Survey to establish success factors for wastewater services provision

I am conducting a research to establish success factors for wastewater services provision. You have been identified as one of the key person, where this information can be obtained.

I am therefore requesting you to assist me complete the survey below by answering the appropriate questions. You are not obliged to answer all the questions since some might be applicable to you. I would also want to promise you that the information provided will be used only for the above purpose.

Thank you for you timely and useful information provided.

Note:

- For the questions where answers have been provided please cross (×) the applicable answer.
- Additional information can be provided in the gaps provided below each factor being assessed.
- For scaling 1-5, the lowest assessment is given 1 mark and highest or agreement with statement is given 5 marks

| Issue | Organization Autonomy |
|-------------------------|---|
| Objective Description | Establish the level of autonomy |
| Indicator Values | Questions |
| Policy Autonomy | <ul style="list-style-type: none">▪ The utility is responsible for setting quality standards for wastewater (yes, no, I don't know)▪ The utility is responsible for setting service standards (yes, no, I don't know)▪ The utility is responsible for setting the institutional setup (yes, no, I don't know) |
| Regulation | <ul style="list-style-type: none">▪ The regulator is responsible for ensuring that the utility meets standards for wastewater (yes, no, I don't know)▪ The regulator ensures service standards for wastewater (yes, no, I |

| | |
|--------------------|--|
| | <p>don't know)</p> <ul style="list-style-type: none"> ▪ Does deviation from standards result into some form of penalty from the regulator? There is no regulator, yes there are penalties, no there are no penalties. ▪ Have penalties been applied? (yes, no, I don't know) |
| Financial Autonomy | <ul style="list-style-type: none"> ▪ The utility covers operational expenses for wastewater services provision (yes, no, I don't know) ▪ If no what percentage of the operational expenses are covered by the utility? >40%, 70%,80%,90% ▪ The utility sets the tariff for wastewater services? (yes, no, I don't know) ▪ The utility proposes tariff adjustment to the regulator (yes, no, I don't know) |

Provide a brief description on the level of autonomy and wastewater services

| | |
|-------------------------|--|
| Issue | Leadership |
| Objective Description | Establish the level of Leadership |
| Indicator Values | Questions |
| | <ul style="list-style-type: none"> ▪ Leaders here serve as positive role models (e.g. honest, hardworking, balances peoples needs with organizations needs, is enthusiastic) (very low, low , medium, high and very high) ▪ Leaders here have sufficient level of knowledge to inspire others (very low, low, medium, high and very high). ▪ Leaders here listen as well as instruct (yes to all, no to all, listen but does not instruct, does not listen but instructs) ▪ Leaders here get out into the field and/or visits other offices (sometimes, regularly, all the time, Never) ▪ Leaders here demonstrate competence and are visibly interested in wastewater services (very low, low, medium, high and very high) ▪ Leaders here specify clear performance standards for wastewater and are strict but fair, gives positive and negative feedbacks (There are no performance standards, there are performance standards but no feed backs, there are performance standards with feedbacks, there are performance standards with only negative feedbacks) ▪ Leaders here continuously guide technical staff to ensure that levels of technology used are suitable in terms of simplicity of operation and maintenance (very low, low, medium, high and very high). |

A Brief description of the perception of leaders on wastewater services

| | |
|-------------------------|---|
| Issue | Corporate Culture |
| Objective Description | Corporate culture and wastewater services provision |
| Indicator Values | Questions |
| Mission | <ul style="list-style-type: none"> ▪ The utility has a mission clearly outlining wastewater services (yes, no, I don't know) ▪ The mission is clearly displayed for all people to read and understand (yes/no) ▪ Do people know the mission? (yes, no) |

| | |
|------------------------|--|
| | <ul style="list-style-type: none"> ▪ Managers assist staff to understand and work towards the achievement of the mission (1-5) |
| History/ Continuity | <ul style="list-style-type: none"> ▪ The utility has an organization chart clearly delineating the functions of wastewater services (yes/no) ▪ The utility has a core group of people working in wastewater department over the past ten years (yes/no) ▪ The utility has a high staff turnover (yes/no) ▪ The budget of the wastewater department is similar to that for water supply? (yes, no) ▪ The number of staff of the wastewater department is similar to that for water supply? (yes, no) |

| | |
|-------------------------|--|
| Issue | Customer Orientation |
| Objective Description | Establish the extent the utility has established consumer orientation regarding wastewater services |
| Indicator Values | Questions |
| | <ul style="list-style-type: none"> ▪ The utility is dependent on its customers for financing wastewater services (1-5) ▪ Does the utility conduct customer surveys (yes, no, I don't know) ▪ The utility has instruments to establish customers opinions regarding wastewater services (low, medium, high) ▪ The results from customers opinions are incorporated into operation of the utility (yes, no, I don't know) ▪ The utility has instruments (customer charters, customer contracts, etc) in place to arrange for rights of customers (yes, no, I don't know) ▪ The utility incorporates compensations payments incase it fails to meet its obligation (yes/no) ▪ The utility has instruments in place and trains staff in dealing with customers for issues related to wastewater services (yes, no, sometimes) ▪ Customers are involved in decision making in the utility for issues related to wastewater services (low, medium, high) ▪ What percentage of complaints for wastewater is addressed? |
| Issue | Commercial orientation |
| Objective Description | Extent which actions of the utility are directed towards financial sustenance in wastewater services provision. |
| Indicator Values | Questions |
| Operating Efficiency | <ul style="list-style-type: none"> ▪ The tariff for wastewater takes into account consumers perception of the service and their willingness to pay (yes, no, I don't know) ▪ The tariff does not cover operational costs for wastewater services (yes, no, I don't know) ▪ If yes, to what extent does the tariff recover operational expenses for wastewater services (40%, 70%, and 90%)? ▪ The utility has marketing activities to ensure consumers pay for wastewater services (yes/no) ▪ What is the billing collection ratio (50%, 70% 85%, 90% 95%) |
| Cost Reduction | <ul style="list-style-type: none"> ▪ The utility employs cost reduction measures (low, medium, high) ▪ What types of cost reduction measures are used? |

| | |
|------------------------|--|
| Operational Efficiency | <ul style="list-style-type: none"> ▪ The utility has a programme in place to improve operational efficiency? (yes/no) ▪ The utility sets performance targets relating to operational efficiency? (yes/no) ▪ There are rewards and penalties related to operational efficiency? there are no reward and penalties, yes to both, rewards only |
|------------------------|--|

Briefly explain the cost reduction measures for wastewater

| | |
|-------------------------|--|
| Issue | Technical Capacity |
| Objective Description | Extent which the utility has competence in conducting technical work. |
| Indicator Values | Questions |
| | <ul style="list-style-type: none"> ▪ The utility has technical staff to make technical decision (Very low, low medium, high, very high) ▪ The utility has experienced and qualified staff in wastewater services (Very low, low medium, high, very high) ▪ The utility has qualified and experienced managerial staff in the wastewater services department? (Very low, low medium, high, very high) ▪ There are enough and appropriate equipment to undertake projects? Very low, low, medium, high, very high ▪ The Utility undertakes new projects in wastewater services provision (Very low, low medium, high, very high) ▪ If yes, the utility has enough and qualified staff to supervise new projects (Very low, low medium, high, very high) ▪ The utility uses different and appropriate technologies for wastewater treatment. (Very low, low medium, high, very high) ▪ The utility has qualified staff for undertaking research in wastewater services improvements (Very low, low medium, high, very high) |

Briefly describe the personnel employed to handle wastewater technical work

| | |
|-------------------------|--|
| Issue | Development of human resources |
| Objective Description | Extent which the utility has competence in conducting technical work. |
| Indicator Values | Questions |
| | <ul style="list-style-type: none"> ▪ There is a transparent procedure for hiring staff (yes/no) ▪ This procedure is also followed? (yes, no, sometimes) ▪ Manpower required to work in the wastewater services is planned (yes/no) ▪ There are performance indicators required for staff promotion (yes/no) ▪ Staff salaries are comparable to with the opportunities outside the utility (yes, no ours are higher, no our are lower) ▪ New staff go through a system of apprenticeship (yes/no) ▪ You have a training program for wastewater management (yes/no) ▪ Is the training programme targeted at specific problems of providing wastewater services or are these 'general training programmes? (specific for wastewater issues, general training) ▪ There is a system of knowledge transfer among staff (yes, no, somehow) |

| | |
|--------------|---|
| Issue | External Accountability |
| Objective | Extent to which external players hold the utility accountable for the |

| | |
|-------------------------|--|
| Description | performance regarding sanitation services. |
| Indicator Values | Questions |
| | <ul style="list-style-type: none"> ▪ Does the utility have to meet specified performance indicators (standards) for wastewater services? (yes, no, I don't know) ▪ If yes, is the utility subjected to penalties and/or rewards to ensure compliance? Yes to all, yes to rewards, no to penalties, no to all. ▪ Does the utility produce annual reports clearly showing the achievement in wastewater (yes/no) ▪ Are the reports audited (yes/no) ▪ Are external groups represented in advisory or board of directors' body? (yes/no) (NGO's, customer groups, government, financing institutions) ▪ Has the utility secured any loans from lending agencies? (yes, no, I don't know) ▪ If yes, do the loans require achievement of some performance indicators? (yes/no) |

Briefly describe others ways the utility accounts to external players

| | |
|-------------------------|--|
| Issue | Internal Accountability |
| Objective Description | Extent to which staff of the utility are held accountable for their performance. |
| Indicator Values | Questions |
| | <ul style="list-style-type: none"> ▪ How often does the utility management meet with the Board of Directors? (Once a fortnight, once every month, once every two month, once every six month, others) ▪ Are there performance standard for wastewater required of the Managing Director by the Board of directors (yes, no) ▪ If yes, are penalties and/or rewards applied to the Managing Director by the Board of Directors for achieving specified performance targets? (No rewards and penalties, only rewards are applied, rewards and penalties are applied) ▪ Are penalties and rewards applied to staff by the management for achieving specified wastewater performance targets? (no performance targets exit, No rewards and penalties, only rewards are applied, rewards and penalties are applied) ▪ Staff is subjected to annual evaluations on the functioning in the utility? (yes/no) |

Briefly describe others ways internal accountability of results is achieved for wastewater services

| | |
|-------------------------|--|
| Issue | Interaction with key external institutions |
| Objective Description | Establish the influence of external institution on utilities providing wastewater services. |
| Indicator Values | Questions |
| | <ul style="list-style-type: none"> ▪ The parent ministry provides financial support in improvement of wastewater services delivery? (yes, no, sometimes, I don't know) ▪ The parent ministry has given support to revise the tariff in the past five years (yes/no) ▪ The municipality offers support from the municipality (yes/no) ▪ Donors have provided financial support to improve wastewater services |

| | |
|--|---|
| | <p>(yes, no, I don't know)</p> <ul style="list-style-type: none"> ▪ Nongovernmental organizations play an import role in the provision of wastewater services (disagree, somehow agree, agree strongly agree) ▪ The union has a great influence on the functioning of the utility (disagree, somehow agree, agree strongly agree) |
|--|---|

Appendix iii: List of People Interviewed

| # | Name | Position | Date |
|--|----------------------------|---|----------------------------|
| National Water and Sewerage Corporation | | | |
| 1 | Dr William Muhairwe | Managing Director NWSC | 7 th Jan 2008 |
| 2 | Mr. Kakuba Mpango | NWSC Corporation Secretary | |
| 3 | Can Amos Lapenga | Human Resources Manager, NWSC | 4 th Dec 2008 |
| 4 | Mr. Isingoma David | Planning Manager | 12 th Dec 2007 |
| | Willy Nuwamanya | Commercial and Customer Manager | 7 th Jan 2008 |
| 5 | Mr. Maiteki James | Sewerage Services Manager | Several times |
| 6 | Mr Sonko Kiwanuka | Production Manager | |
| 7 | Dr. Rose Kaggwa | Manager External Services and Research | Several times |
| 8 | Mr. Christopher Kanyesigye | Quality Control Manager | 7 th Jan. 2008 |
| 9 | Fridtjof Behnsen | Technical Advisor, Germany Development Corporation | 4 th Jan. 2008 |
| 10 | Mr. Arnold Waiswa | NEMA environment assessment coordinator | 15 th Jan 2008 |
| 11 | Ms. Florence Adongo | Assistant Commissioner at the Directorate of Water Resources Management | 16 th Jan 2008 |
| Johannesburg Water | | | |
| 1 | Prof. Jacques Labre | Director Relations Institutionelles, SUEZ | 12 th Feb. 2008 |
| 2 | Jean Pierre Mas | Chief Executive Officer | 12 th Feb. 2008 |

Appendix iv: List of Documents reviewed

1. Third Performance Contract for the period 1st July 2006 -30th June 2009 between the Government of the Republic of Uganda and National Water and Sewerage Corporation, July 2007.
2. National Water and Sewerage Corporation Corporate Plan 2006-2009
3. Financial Proposal “Kampala Sanitation Program” (Sanitation Measures for Enhanced Basic Sanitation Coverage and Protection of Lake Victoria)
4. Strengthening of National Water and Sewerage Corporation Head Office into an Asset Holding Authority and Strengthening of the Regulatory Framework for the Urban Water and Sanitation Sub-Sector in Uganda, Draft Concept Report.
5. Uganda Water and Sanitation Sector Performance Report 2007, September 2007.

6. Annual Reports for National Water and Sewerage Corporation 2003 -2007
7. Sanitation Strategy and Master Plan for Kampala, Vol. 2-Main Report, April 2004.
8. The National Water and Sewerage Corporation Act, chapter 317.
9. The Uganda Water act, chapter 152.
10. Management Contract between Johannesburg Water and JOWAM (2001-2006), Summary of the results achieved, June 2006
11. Johannesburg Water Annual report 2006/2007

Appendix V: Reward and Penalty Structure (NWSC)

Reward structure

The reward structure shall include a performance element of up 12% of annual gross salary (AGS) on the achievement of outstanding performance (OP) translating into a Composite Aggregate Score (CAS) of 4.4% of the AGS on achievement of the Inline Performance Standards (IPS) which translate into CS of 2, zero incentive for a CAS of 1 which is interpreted as underperformance and a prorated percentage of AGS for any performance in between. The incentive shall be computed at follows

Incentive = $AGS * 4\% * (CAS - 1)$, applicable only if $CAS > 1$

Where:

$$CAS = (0.175X_{RCE} + 0.2X_{WR} + 0.075X_{RCD} + 0.05X_{WS} + 0.15X_{CW} + 0.05X_{NRW} + 0.15X_{NC} + 0.1X_{PAR} + 0.05X_{SPE})$$

CAS = Composite Aggregate Score

X_{RCE} = Performance score on return capital employed

X_{WR} = Performance score on working ratio

X_{RCD} = Performance score on receivable collection days

X_{WS} = Performance score on water sales

X_{CW} = Performance score on capital works

X_{NRW} = Performance score on Non Revenue Water

X_{NC} = Performance score on New connections

X_{PAR} = Performance score on percentage of audit recommendations implemented

X_{SPE} = Performance score on staff performance evaluation

Penalty

Penalty = $AGS * 4\% * (1 - CAS)$, applicable only if $CAS \leq 1$