CHAPTER ONE
INTRODUCTION

Background to the study
According to the (UN - Habitat 2006.P.3), among the key challenges resulting from rapid urbanization in developing countries is how to provide adequate levels of public infrastructure and services for the increasing urban population. This challenge is compounded by the fact that most of this rapid urbanization is taking place informally. Inadequate water supply, poor sewerage disposal, uncollected solid waste, poor drainage systems, illegal development of land and the proliferation of informal housing without inadequate provision of basic infrastructure facilities are some of the negative effects of urbanization. Therefore, for those organizations and individuals charged with service delivery in urban areas, a key challenge will be keeping up with the rapid pace of urban population growth.

Zambia is one of the countries with the lowest water supply and sanitation coverage in the world. Only 14.9% and 39.2% people have access to proper sanitation facilities and access to safe water supply respectively (GRZ.2002.P.2). With regards to urban water supply and sanitation, it is confronted by many problems that require urgent redress if the growing demand resulting from increased urbanization is to be met. Therefore, there is an ever increasing demand for water and sanitation services in cities such as Kitwe and the problem of service delivery is a serious one. With this background in view, this paper attempts to understand the nature and extent of the inadequacies of water and sanitation service delivery and access in the high density areas of Kitwe.

Statement of the problem
Despite the existing structures in the provision of water and sanitation services in the high density areas of Kitwe, access to these services is very low. The Nkana Water and Sewerage Company and the Kitwe City Council, the service providers, do not seem to be meeting the demand for water supply, solid waste removal and sewerage services. The nature and extent of the inadequacy in water and sanitation service delivery in the high density areas of Kapoto, Chimwemwe, Buchi, Mulenga, Chipata and Wusakile still needs to be established.
Objectives of the study

i) General Objective
To investigate the nature and extent of the inadequacy of water and sanitation service delivery and access in the high density areas of Kitwe.

ii) Specific Objectives
a) To examine the nature of water supply in the high density areas of Kitwe.
b) To investigate the nature and extent of the inadequacy in the provision of solid waste removal services in the high density areas of Kitwe.
c) To assess the extent of the inadequate access to sewerage services in the high density areas of Kitwe.

Rationale of the Study
The nature and extent of the inadequacy in water and sanitation service delivery and access in Zambia has not been comprehensively studied and documented. Lack of such information and experience limits the mainstreaming of interventions to manage and address the problems especially in the high density areas.

The prevailing situation that generates the existing conditions of the problem in urban areas is, if anything, is known in an isolated manner, yet such processes are perceived to work together in an integrated way. Particular elements of the inadequacies are an integral part of a holistic and dynamic relationship and therefore difficult to separate the problem of water supply, solid waste removal, access to sewerage services with problems of high population growth, housing conditions and governance issues.

Without credible knowledge on this synergy, it is rather difficult to effectively address the problem. By providing more knowledge on this subject, it is possible to chart out more effective urban water and sanitation practices and systems which will be beneficial in a sustainable manner. Therefore, potential beneficiaries of the findings from the study are; policy makers, local authorities, service providers, various stakeholders, the communities and individuals at the household level.
Scope of the study
In its pursuit to provide adequate water supply and sanitation services in high density areas, the central government, local authorities and various stakeholders are faced with the problem of how to meet demand and improve service delivery. With the rapid pace of urbanization taking place, more people being attracted to live in urban areas will remain without access to these services. The assumption of this study is to provide evidence on the nature and extent of the inadequacy of water and sanitation service delivery and access in the high density areas. Therefore, the preference of study is the fact that, the existing literature has not written much about this problem with a broad analysis of high density areas such as Kapoto, Chimwemwwe, Buchi, Mulenga, Chipata and Wusakile.

Conceptual Framework
Over the years, there has been debate on the best and most effective way to deliver basic services such as water and sanitation. However, despite many debates, the provision of such services should be about providing services that are affordable and adequate. Understanding the link among the various concepts that relates to water and sanitation service delivery is therefore, crucial. Some of the concepts that require defining include: urbanization, high density areas, municipal sanitation services, water supply, waste water and sewerage services and municipal solid waste management (MSWM). The others include those that affect access to service delivery which are accessibility, affordability, availability and quality.

Urbanization, simply defined, is the shift from a rural to an urban society and involves an increase in the number of people living in urban areas. The forces, behind such are rural-urban migrations, natural population increase and the engulfing of peripheral rural settlements by urban expansion (Garth.2005. P.84). The effects of urbanization are very clear; as cities expand they give rise to both planned and unplanned high density areas.

The planned high density areas are legally recognized unlike the unplanned high density areas (often known as informal settlements, slums, low-income areas and squatter settlements) (Herderson.2000.P.12). Despite their legal status, these residential areas have several characteristics in common. These include having undergone physical expansion in size with large populations residing in them. The residents living in these areas often lack access to adequate and affordable basic services such as water supply, solid waste collection and sewerage
services as well as other services such as storm water drainage, street lighting and roads (Renaund. 1981. P.45).

Urbanization has impacted heavily in the delivery of three municipal sanitation services. The first is water supply, which involves the construction, operation and maintenance of public water systems, including production, acquisition and distribution of water to the general public for residential, commercial and industrial use (Manda.2007.P.56). However, the definition of water supply here has been limited to drinking water supply involving the collection, treatment and distribution of water through a central water supply system for domestic use.

The second municipal sanitation service is a wastewater sewage and treatment service which involves the collection of liquid waste collected from residential, commercial, and industrial areas and conveyed with a sewage system to a treatment plant (Kavimba.2002.P.45). However, in this thesis the definition only refers to the provision, operation and maintenance of sanitary and storm sewer systems, sewage disposal and treatment facilities. In the case of the high density areas of Kitwe where sewage systems are used, the wastewater is mainly the liquid waste collected from households and derived largely from the water supply.

The third municipal sanitation service is municipal solid waste management (MSWM); the collection, removal and disposal of garbage, refuse, hazardous and other solid wastes. The provision of MSWM is often the role of the municipal or other governmental authorities though the private sector does provide the service for profit reasons (Gombya.2005.P.8). Synonymous to MSWM is the use of terms such as “garbage”, “trash”, “refuse” and “rubbish” which are categorized in seven groups. These categories which also has a profound effects on the technology to be used for collection and disposal are; residential (household or domestic waste), commercial, institutional, street sweeping, construction and demolition, sanitation and industrial wastes. However, MSWM in this dissertation is simply taken to imply domestic waste generated from households which consist of everyday items such as food, product packaging, grass clipping, furniture, clothing, bottles e.t.c.

The provision of water and sanitation services is not enough, it also requires assessing accessibility. Accessibility has been taken to imply an assessment as to whether water and sanitation facilities are within the physical reach and accessible by members of a household. The proportion of households accessing piped water supply, solid waste removal and sewerage services have been investigated. In addition, this study has modified access to investigate
availability, affordability and quality.

Affordability here has been taken to mean an assessment as to whether households are able to afford the costs (service charges). This concept is an important aspect of access because to the poor it signifies the poor circumstances as the consequence of poverty and it is this factor that causes the poor to be less able to access adequate services. For instance, the poor normally do not have secured income on a regular basis. The poor mostly obtain incomes on a daily basis, and thus daily purchase of water would suit them better rather than paying monthly bills and it can also result in them resorting to the use of hand dug wells as alternative sources of water (Garth, 2005.P.34).

The availability of water and sanitation services is another concept that can be used to assess access. The human right to water is limited to availability and its use. Likewise, a sufficient number of sanitation facilities must be made available. This concept is important because the allocation of these services must be sufficient, of adequate quantity for personal and domestic use. As a result, ensuring availability of water supply, solid waste removal and sewerage services in order to meet the right to water and sanitation requires both greater prioritizations of essential domestic uses (Karen.2004.P.12).

Lastly, quality as a concept is taken to imply assessing as to whether the water and sanitation services which is being accessed is safe for use. This will involve assessing factors such as, “is the water supplied, of acceptable quality that does not pose a threat to human health?” Similarly, “are the sanitation services safe, hygienically and technically?” Therefore, access to water for cleaning and hand washing is essential and so is the water to be used to clean sanitation facilities such as a pit latrine or a flash toilet (Mara.1996.P.45).

**Literature Review**

There is not much literature written specifically on the nature and extent of the inadequacies in the provision of water and sanitation service delivery and access in Zambia. What is available dwells largely on urban water supply and performance description, household solid waste generation behavior and waste characteristics, urban management, urban settlement policies, housing conditions, urban population increase and urban poverty, all of which this dissertation has acknowledged to be relevant. Although a number of studies have been undertaken by other scholars, government institutions, research institutions and cooperating partners these have
substantively discussed the provision of other basic services such as education, health, community development, rural water supply and urban water borne disease outbreaks, e.t.c. with little emphasis on tackling the problem on the nature and extent of the inadequacies in the provision of water and sanitation service delivery and access in the high density areas of Zambia.


The writing by Mutale (1978) provides literature on housing, water and sanitation service delivery in Kitwe. The writing by Mutale places Nkana - Kitwe in a colonial historical context and analyzes the evolution of urban management and settlement policies in Zambia. The author discusses service provision in the case of water and sanitation, adequacy of housing provision and the nature of housing problems. The significance of this work is that it provides an overview on urban regeneration and community revival in a post-industrial world. This is useful to academicians and researchers who want to understand the evolution and nature of urban development in Zambia and the unique history that goes with it. The author bases his analysis on a rich array of historical sources, some of which are unique to this work.

The writing by Mutale is very useful in the method the history of water and sanitation service delivery in Kitwe was discussed. However, the discussion was not linked with the problems of poor planning of high density areas as one of the major cause of the problem of water and sanitation among households in the foreseeable future, currently occurring. The writings by Mutale did not also discuss the effects, the mushrooming of informal settlements then, were going to impact on the provision of water and sanitation services.

The writings by Munthali (2000) and Banda (2003) were very useful in the understanding of solid waste management. Munthali approached the discussion by explaining the status of community based solid waste management with the case study, being Kamanga compound in
Lusaka. The scholar carried out an analysis on the types of waste generated by households, how it is collected and disposed as well as the actors involved in MSWM. Munthali’s dissertation provides an insight on actors involved in MSWM and how these actors can be used by other high density areas with similar problems. This study is of interest to study areas such as Chipata, Mulenga and Kapoto compounds which have the same history, physical set-up and characteristics like Kamanga compound. The gaps in relation to this study is that it concentrated much on examining the type of wastes generated at each households (non-biodegradable and degradable), how to manage and dispose waste. This can be difficult to implore because it requires sensitizing people on the detailed scientific ways of managing waste such as, methods of incinerating, recycling and disposal practices based on the type of waste generated.

Banda (2003) takes a different perspective from Munthali on his research about the historical, policies and legal frameworks in the provision of water and sanitation in Zambia. The author provides different ideas on the existing opportunities that can be used to support private sector participation in service provision in order to fill the gaps left by the local authorities. The gaps in this study with reference to this dissertation is that it failed to recognize the constraints that hinder private sector participation in water and sanitation service delivery in Zambia. Banda’s thesis should have recognized the fact that private sector participation in MSWM management is a complex issue. First, it stems from the legal framework which does not allow competition among service providers. For instance, a company would like to invest in service provision but because it has to face competition from non profit making local authorities that receive government subsidies, it would not invest in such a business. Secondly, private companies would rather not invest in a business that it considers loss making and besides, even if it starts operating, it will only offer these services to planned residential areas that they think are economically viable, thus, leaving the informal settlements were the poor reside.

Other literature that has attempted to discuss the provision of water and sanitation services are those whose emphasis was on urbanization and its impact on the provision of infrastructure and services. Such literature includes writings by Kangwa (2000), Kanyense (2006), Mason (2001) and Sibande (2002). Kangwa explains the impact of fragmented settlements on service provision and the development of infrastructure in Zambia. Sibande tackles the thesis by explaining the impact of upgrading squatter settlements on access to decent
housing in Lusaka. Mason evaluates the effect of urbanization on social class and Kanyense takes another perspective by explaining the trends of urban housing development in Lusaka.

These studies provide a general overview on the effects of urbanization on housing, water and sanitation, urban poverty on low-income settlements, as well as urban housing policies and programs in Zambia. They have provided a history on some of the earliest attempts undertaken to upgrade squatter settlements in Zambia with specific reference to the squatter upgrading projects schemes that were conducted on George, Chipata and Chaisa compounds of Lusaka in the 1970s. These studies asserted that after independence in 1964, the government tried to address the rural urban imbalance that was created during the colonial era. The writers explain that the milestone towards squatter upgrading was in 1974 when the Housing Law was enacted and recognized the rights of people living in unplanned settlements, which showed a commitment on the part of the government to provide services to such areas. This paved the way for the implementation of a programme on sites and services and squatter upgrading with financial support from a $20 million World Bank project. Although this project achieved some results through the upgrading of Kamanga Compound in Lusaka, the writers indicated that it was not sustainable and could not be expanded to other urban areas in the Copperbelt Province. However, the scholars did not explain the reasons behind the increase in low income settlements and their diversity as regards to representing a cross section of Zambian urban life.

The studies are useful to this dissertation because they all acknowledge that most of the informal settlements are settlements created by the encroaching of land illegally by urban residents without approved boundaries and standards. They all agree that although these areas are deemed illegal, they are actually places accommodating large populations and need to be upgraded and legalized for the provision of piped water supply, drainage systems, access to roads, sewerage and refuse disposal services. However, there are gaps with regards to their explanation on the upgrading of informal settlements which did not consider explaining the past histories of such areas and the impact that population increase has brought on service delivery as well as if the service providers (central and local governments) had the capacity.

All the scholars discussed that that unauthorised areas represent social and economic capital that cannot be brushed away. They agree that the only way is to build conventional housing units to address the shortage of housing in urban areas. The all suggested that there was need to replace the poor planned houses with conventional houses by institutions such as the
National Housing Authority (NHA) at a cost. This idea is wrongly conceived especially that it failed to take into account that most people living in urban slums are very poor and cannot afford the cost of conventional houses. Besides the past experience has shown that the allocation of these houses is marred with corruption and the intended beneficiaries do not actually benefit at all and people with financial resources residing in planned residential areas end up benefiting.

Although most of these studies analyzed the legislative frameworks that exist to help address the problem, they failed to take into account some of the flaws that can be found in the policies such as the National Water and Sanitation Act of 1997. When analyzed critically this operational framework has an institutional and legislative arrangement that affect the nature of the relationship between various stakeholders, sanitation agencies and communities which in turn affects the provision of services. For instance, since most informal settlements are considered illegal and there is no sanitation policy enacted to cater for them; this affects investments in the water and sanitation sector. The structure, regular system and chains of command for local authorities are vertical and allow limited community participation. For instance, whereas communities want local authorities to be accountable to them, the institutional structures make local authority workers accountable to higher officers. This lack of clear institutional representation between a wide range of ministries and departments, the absence of clear polices and the conflicting legislation by all actors involved in service provision contribute to failure to deliver services.

In addition, the gaps in relation to this study are the writer’s failure to recognize the needs of the urban poor in terms of what they want and what local authorities think are of appropriate standards. For example, where service providers are more worried about the effect of sanitation technologies in blocking disease transmission routes (health) and safety, the urban poor are concerned about privacy, status, aesthetics and affordability. This is made worse by the lack of efficient communication structures that can be used to link the urban poor with the sanitation agencies involved in service provision as well as recognizing CBOs legally and making them strong to function properly. For instance, most Community Based Organizations (CBOs) are weak and lack legal recognition. The institutional arrangements, sanitation agencies and the urban poor have different views about financial issues. Whereas sanitation agencies are worried about cost recovery and economic efficiency, the urban poor are more worried about affordability and poverty.
The studies also do not recognize the fact that community participation in issues relating to sanitation heavily depends on how organized a community is. Most communities in the informal settlements are not organized when compared to those found in less densely populated areas where communication mechanisms can allow good community organization. Despite this, it has not been realized that poor sanitation is as a result of strong, transparent and effective linkages between the local authorities and the urban poor. The institutional and financial arrangements and approaches adopted also do not consider the social - cultural context, nor the needs and priorities of the urban poor. For instance, in promoting sanitation, the local authorities and other agencies use scientific evidence to explain the link between sanitation and health without realizing that community needs are different from what they need. To a common person, sanitation is a way of life which is influenced more by cultural beliefs and attitudes towards risk. The local authorities should therefore, understand all these factors and plan accordingly so that their services meet the expectations of the urban poor through the systems of combining service provision while educating them on good sanitation practices.

Other scholars in the fields of medicine and engineering have also written on the problem of water and sanitation service delivery in Zambia and the most noted in this study are Kavimba (2002) and Oyatt (2001). Kavimba takes an engineering perspective and discusses waste water stabilization ponds for the treatment of municipal waste in Zambia with the case study being Chingola. This study is relevant because it explains the nature of waste water management practices. The writer examines the types of drainage systems, the composition and state of waste water treatment works in Chingola, a mining town similar to like Kitwe whose municipal works had a dual designed structure, managed by the municipal council and the then ZCCM.

On the other hand, Oyatt takes water and sanitation service delivery on a medical perspective and assessed the relationship between drinking water source and diarrhea in children by determining the problems of solid waste disposal, personal hygiene and the unhygienic living conditions of the Misisi Compound residents in Lusaka. This thesis is relevant to this dissertation because it explains clearly that poor water supply and solid waste collection is the major cause of water borne diseases in shanty compounds like Misisi which has similar features like the study areas of Chipata, Kapoto and Mulenga compounds. However, the writer concentrated much on discussing the causes of diarrhea diseases and how to prevent and diagnose it which is not the objective of this study. It also failed to critically discuss the complex issues that have led to the
problem of disease outbreaks and more explanations should have been made on how poor planning and overcrowding are linked to disease outbreaks in high density areas. The writer should have provided solutions on the best ways of reducing diarrhea diseases because diagnosis is not all sufficient, if prevention through community sensitization on acceptable methods of human waste disposal, solid waste disposal and use of protected sources of water is not done.

This study has acknowledged the writings of most Zambian literature and it has therefore discussed the inadequacies in water and sanitation service delivery to fill the gaps. The study first assessed the nature and extent of water supply and access and also examined the capacity of the NWSC. The gaps with regards to literature on the inadequacies in solid waste removal and access to sewerage services were also filled. This was done by assessing service coverage and access as well as examining the capacity of the NWSC and the KCC; the service providers.

The effects of low service coverage and access were also revealed to fill the gaps on literature on water and sanitation service delivery in Zambia. Of course, an assessment of accessibility, affordability, availability and quality of the services as well as the levels of satisfaction with service provision were also done. All the gaps that were filled have not been discussed together by most literature that had been referenced in this dissertation.

Relevant literature to this study on water and sanitation service delivery can also be obtained from Mulenga et al (2000) who linked how urban sanitation agencies can help poor community needs in Zambia, South Africa and Zimbabwe. It presented facts on how the lack of meaningful links between the poor urban dwellers and sanitation agencies affect access to sewerage services. The study indicated that almost 80% of the residents in all informal settlements principally use unimproved pit latrines as their means of human waste disposal. However, although in some areas “access” to flush toilets is there, the study indicated that it is masked by problems of gross overcrowding resulting in sharing of facilities such as toilets and taps.

Although the study presented findings that there is an existence of successful MSWM partnerships between the local authorities and communities in some study areas of Durban, Lusaka and Harare, the study also revealed that most urban areas in these countries have a MSWM practice which leads to frequent disease outbreaks. This study also revealed that most urban residents in these cities use refuse pits or dump waste indiscriminately on open spaces causing foul smells and the breeding of mosquitoes and flies which is not healthy. The study also
indicates that poor sanitation service delivery cause a high rate of diarrhea outbreaks which is suffered by most urban dwellers in all the three countries. Worse still, the study revealed that, even in areas where local authorities provide solid waste removal services, at times refuse is not collected for two weeks or more. The absence of health-care facilities in most informal areas makes disease control difficult. Little health or hygiene promotion is carried out in informal settlements, except during outbreaks of infectious diseases.

The research by Manda (2007) also provides relevant information on the provision of water and sanitation services. The study determined the status of water and sanitation provision in low-income housing communities in urban Malawi. The quality and extent of water and sanitation service delivery in urban Malawi, where 60% of the population lives in informal settlements was presented. It also evaluated Malawi’s efforts in providing these services in relation to meeting the Millennium Development Goals (MDGs). The study is relevant to this study because it also examines the current and potential role of community-led sanitation improvements. It also provides recommendations for interventions needed by governmental, international and civil-society organizations to improve living conditions of communities to contribute to the realization of the MDGs, a goal that Zambia is striving to achieve.

The study by Gombya (2005) is also relevant to this study in many aspects. The study was undertaken with a focus on MSWM in Kawempe Division by the Kampala City Council. The main emphasis of this study was an assessment at the nature, practices, challenges, and possible solutions for garbage management systems at community level. The study places emphasis on domestic waste generated as a result of the large population of people living in Kawempe; an urban slum in Uganda. The study revealed that most of the communities in this area currently use illegal methods of waste disposal such as throwing waste on open spaces or in household pits for burning and burying. Further, the scholar used participatory approaches on poor communities to provide suggestions on how people can generate income from waste disposal activities, if certain measures are put in place. The relevance of the study to this research lies on its approach to the main challenges facing waste management and stress on the problem of inactivity of the existing institutional framework to support and mobilize waste disposal, which is important for informal settlements such as Kapoto, Chipata and Mulenga, the study areas with similar characteristics to Kawempe.
1.7. Methodology
The methodology used in this study was as follows.

1.7.1. Study Design
The research is a Case Study which focused on the nature and extent of the inadequacy of water and sanitation services and access in the high density areas of Kitwe. A Case Study was preferred because of the following reasons:

(i) A Case Study depicts a contemporary phenomenon. In this study, the subject of investigation was the existing situation of the inadequacy of water and sanitation service delivery and access in the high density areas of Kitwe.

(ii) Secondly, like any other study, a case study relies on multiple sources of data. In this study both primary and secondary sources of data were used.

(iii) Thirdly, a case study allows for insight to the generalization about a particular phenomenon at the cost which is relatively lower than the one that can be incurred using another study design.

1.7.2. Research Design
The research is a qualitative research which used Purposive and Systematic Sampling.

a) Purposive Sampling
Also called Judgmental sampling, a process where a sample is chosen on the basis of what the researcher thinks is typical of the population was applied as follows: first, the researcher inquired from local authorities on the category of residential areas that were suitable for collecting data. Six (6) selected study areas were chosen randomly categorized into three groups; a mine area, planned medium residential area and informal settlements. And second, the researcher conducted interviews with people from the Kitwe City Council, Nkana Water and Sewerage Company and various Stakeholders listed in Appendix IV.

b) Systematic Sampling
The study comprised a pilot project and the main study. A sample of thirty (30) respondents (households) was engaged in the pilot study. The idea of the pilot study was to test the study instruments so as to provide insights on the performance of instruments to enable necessary adjustments to be made before carrying out the main study.
In the study, a total of (6) six residential areas were selected on a judgmental basis and the following high density areas of Kitwe were selected:

- Buchi
- Wusakile
- Chimwemwe
- Kapoto
- Chipata
- Mulenga

The study areas were selected in order to have a fair representation and have a deeper understanding of the underlying research problem using a household questionnaire with both open-ended and closed-ended questions covering a range of issues from personal information, housing conditions, access to water supply, problems and access to solid waste and sewerage services. Simple random sampling was used to select households in each of the six (6) residential areas. To this effect each residential area received fifty (50) Questionnaires administered amongst the households.

Note that the equal sample of fifty (50) respondents was chosen on a judgmental basis to allow a fair representation, comparison and an independent generalization of the outcome. The study areas fall into three different physical characteristics, a mine area (Wusakile), two planned medium residential areas (Buchi and Chimwemwe) and three unplanned informal settlements (Kapoto, Chipata and Mulenga Compounds).

The researcher conducted guided interviews with the following: -

Kitwe City Council

(i)

- Senior Health Inspector
- Health Inspector
- Public Relations Officer
- Six (6) Ward Councilors
- Six (6) Resident Development Committees Chairpersons
- Head of Refuse Collection Unit
- Head of Community and Health Services Department
- Six (6) Council Representatives (Cashiers) from Markets

(ii) Nkana Water and Sewerage Company
- Company Engineer
- Public Relations Manager
- Four (4) Branch Managers, Zone Offices
- Company Secretary
- Supervisor-Bulangililo Water Treatment Plant
- Supervisor- Bulangililo Sewer Works
- Supervisor-Kafue Water Treatment Plant
- Head, Peri - Urban Water and Sanitation Project
- Supervisor- Nkana East Sewer Works
- Three (3) Water Kiosk Attendants

(iii) Private Waste Collectors and Local Organizations
- One (1) Waste Picker
- Three (3) Supervisors for the Private Waste Collectors
- Environmental Health Officer
- Three (3) Representatives for the Market Committees
- Five (5) Resident Development Committees (RDCs)
- Three (3) Community Based Organizations (CBOs)
1.7.3. Data collection techniques
The study relied on primary and secondary data collection techniques and these sources were used on the premise that they should complement each other.

a) Primary Data
Primary data was used to collect qualitative data on the nature and extent of the inadequacies in water and sanitation service delivery and access in the selected high density areas. The semi-structured questionnaires and guided interviews were used to obtain primary data. A total number of 300 households were surveyed to obtain the required data while sixty-three (63) respondents were surveyed using guided interviews from the Nkana Water and Sewerage Company, Kitwe City Council and other Stakeholders.

The researcher found the use of structured interviews to be the most appropriate data collection method for study because of the following reasons. First, structured interviews are more suitable for collecting information that gives the overall indication of progress and achievement of interventions in relation to community needs and preferences. Second, structured but non-scheduled interviews allow for probing in order to find out the underlying meaning and reasons to answers given by respondents, which would otherwise not be possible with other methods of data collection. And lastly, the researcher is able to easily adapt or change the questions during the investigation. This allowed for deeper understanding of the problem under study.

b) Secondary Data
Secondary data refers to data collected by other researchers in connection with other research problem. In this study, secondary data were obtained from published and unpublished documents and these included Books, Pamphlets, Periodicals Journals, Post-Graduate Dissertations and other writings from the Government Ministries, Nkana Water and Sewerage Company, Kitwe City Council and Non-Governmental Organizations.

1.7.4. Data processing
Analytical comparison was used as a method of data analysis. A method of agreement and difference that forms a basis for analytical comparison. The researcher compared responses of each respondent against the asked questions and then compared with the overall respondents with similar answers before making generalizations from the percentage calculations. Upon
obtaining the data on each question the researcher then analyzed the data manually to ensure that they provide a proper interpretation of the question.

1.7.5. Contents of the Dissertation

The dissertation is divided into five chapters. Chapter one deals with the introduction, statement of the problem, objectives to the study, scope of the study, conceptual framework, literature review and methodology. Chapter two provides a historical background and the social-economic profile of Kitwe. Chapter three provides research findings on the nature and extent of water supply and access in the selected high density areas. Chapter four provides findings on the nature and extent of the inadequacies in solid waste removal and access to sewerage services in the high density of Kitwe. Lastly, the conclusions for the dissertation are presented in Chapter five.
REFERENCES


CHAPTER TWO

THE HISTORY AND SOCIAL - ECONOMIC PROFILE OF KITWE

Introduction
This chapter discusses the history and social - economic profile of Kitwe. The first section presents its historical development and the origin of the informal settlements. The second section, examines the geographical analysis and the demographic profile of the selected areas. A general discussion on housing, overcrowding and renting practices and how these are intrinsically linked to the provision of water and sanitation services is also provided. The third section provides an overview on the history behind the provision of water and sanitation, as well as other basic services such as health, education and general administration.

The historical development and origin of informal settlements in Kitwe
The city of Kitwe is located on a 3,000-foot plateau above the sea level and has an estimated area of 777 km², on the Copperbelt Province. The population of the city is estimated at 376,124 and this comprise 189,650 (51.2%) males and 186,474 (48.8%) females (CSO.2005.P.16). However, the transient population from the surrounding towns who come to trade and those living in the agricultural hinterland push the daytime population of the city past the 1,000,000 figure. Its population is diverse and mainly consists of people from all Zambia’s ethnic groups with a small proportion of people of European and Asian origin. In terms of the languages spoken, Bemba and English are the most frequently used.

The origin of Kitwe is associated with the discovery of copper deposits and the commencement of mining operations by Bwana Mkumbwa Mining Corporation in the 1920s. After the successful production of copper, sinking and commissioning of the Mindolo North shaft, it was constituted as a management Board (town in 1931) (Mutale. 1978. P.134). Kitwe is home to one of the largest copper smelting plant, the Nkana Mine and copper mining has remained as the main economic activity of Kitwe. The city is also regarded as the hub “Commercial Capital” of the Copperbelt Province due to its central location, as the focal route to other towns in the country. The first township to be established in Kitwe was Nkana Mine Township which was followed by Wusakile and Mindolo in the 1940s, created as housing units for the African miners. After the opening of a shaft at Mindolo South in 1956, more units (Chachacha, Chamboli and Miseshi) were built as mine suburbs. At the same time, the local
authority through the Kitwe Municipal Council had also built housing units (Chimwemwe, Buchi, Bulangililo, Kwacha, Race Course and Ndeke) to offset the shortage of housing, resulting from the migrating of people from rural areas to seek for employment in the mines and other industries (Mutale. 1978. P.134).

There is no comprehensive written history on the development of informal settlements in Kitwe and what is available today is only oral history. The story relating to a general reference to 200 single men and women living in a squatter settlement of Misundu, the earliest identifiable and still existing squatter settlement is the most outstanding. Misundu was established by a man called, “Shi Mwila” (father to Mwila) in the early 1950s who took advantage of the Kafue River and the areas approximate to the city to sustain his charcoal burning business. However, the development of informal settlements in Kitwe is a post independence phenomenon which was fuelled by limited housing units and the removal of colonial restrictions on the movement of people from the rural to urban areas (Kanyense. 2006. P. 56). As a result, informal settlements such as Itimpi, Kamatipa, Kapoto, Chipata, Mulenga and Zamtane etc. in Kitwe were established after independence between 1966 and 1975.

**Demographic profile and housing**

Since its foundation, Kitwe has had rapid growth in area and population. The major cause of this is mainly rural - urban migration with the motivating factor being purely economic; the search for employment and better economic opportunities. Recently, another phenomenon of urban - urban migration has also been identified as a major cause of population increase; a large number of people are migrating to Kitwe from other urban towns such as Mufulira, Chingola, Luanshya, Kalulushi, Chililabombwe e.t.c where the mining sector is not performing well. For this reason, the population of Kitwe is anticipated to increase and rise to over one million people and with no plans for the developments of housing units more informal settlements will definitely be created (Interview with the Public Relations Officer, Kitwe City Council on 12th July, 2009).

Kitwe has five (5) constituencies; Chimwemwe (87, 671), Kamfinsa (55,454), Kwacha (97, 633), Nkana (64,443) and Wusakile (70, 923). The most populated study area is Chimwemwe (87, 671), followed by Wusakile (70, 923) which themselves are constituencies. The other study areas - Buchi, Kapoto, Chipata and Mulenga did not have the actual figures and depending on location they were emulated as part of townships within their respective
constituencies. Buchi and Kapoto fall under Nkana Constituency which has an estimated population of (64,443). On the other hand, Mulenga and Chipata were emulated as part of Kamfinsa and Kwacha constituencies with populations of (97,633) and (55,454) respectively (CSO.2005.P.25). This analysis was important because demographic profile and housing has a direct influence on the delivery of water and sanitation services in high density areas. For instance, the more populated an area is, the greater chance of having problems such as shortage of housing, overcrowding, large cases of renting practices and the sharing of water and sanitation facilities (World Bank. 2002. P.13).

The location of the study areas and the physical characteristics of house structures had a direct effect on accessing water and sanitation services among households. Buchi, Chipata and Wusakile, centrally located and with inadequate land for expansion had a high rate of people moving to reside in these areas. For instance, Chipata was found surrounded by residential areas such as Riverside and Musonda Compound while Buchi is surrounded by Parklands, Kwacha and borders Chimwemwe on the south. On the other hand, Wusakile, a mine area, is surrounded by the mine plant and Chamboli making it impossible to expand in size (see Map.1).

It was, therefore, found that 255 (85%) of the surveyed residents had each at least two cabins built. Whether a landlord or a tenant, each household was found to be having at least more than five to ten members of the family. The large family composition and high cases of renting practices has a multiplicity of effects on access to water and sanitation. For instance, a large number of people mean that there are higher chances of sharing water points and toilets (NWASCO and DTF. 2005. P.14). Further, the high percentage of renters implies that issues of maintaining sanitation are more likely to be neglected. The reason for this is that occupants lack the incentive for any investment and in any case, when the owner makes improvements, this is accompanied by an increase in rent that can force out the tenant. Again, the high rate of renting implies that there is lack of care to sanitation facilities because to renters the issues of maintaining good sanitation practices are not their primary concern (Kazimbaya et al.2004. P.7).

This analysis also correlated with the duration of stay and house ownership. It was found that 200 (67%) residents indicated having stayed in their residential areas for less than 5 years. The frequent shifting can mean that residents are not satisfied with issues such as the location and access to water and sanitation facilities. Again, frequent shifting can also be attributed to an increase in rentals, for instance, when the owner makes improvements to water and sanitation
facilities. The 100 (33%) residents who indicated having stayed in one residential area for more than ten years are the landlords who were found in Chimwemwe (36), Wusakile (14), Buchi (15), Kapoto (17), Mulenga (5) and Chipata (13).

This analysis also correlated with the duration of stay and house ownership. It was found that 200 (67%) residents indicated having stayed in their residential areas for less than 5 years. The frequent shifting can mean that residents are not satisfied with issues such as the location and access to water and sanitation facilities. Again, frequent shifting can also be attributed to an increase in rentals, for instance, when the owner makes improvements to water and sanitation facilities. The 100 (33%) residents who indicated having stayed in one residential area for more than ten years are the landlords who were found in Chimwemwe (36), Wusakile (14), Buchi (15), Kapoto (17), Mulenga (5) and Chipata (13).

Map.1. Map of Kitwe and its residential areas

Social - Economic profile of Kitwe

From the city’s inception, mining has greatly influenced Kitwe’s economic set-up and growth. Copper mining is the city’s central economic activity (backbone) which fuels the hopes of its population as a source of employment and bustling business opportunities. The mining of copper and Cobalt is done at two underground mines; Nkana in the south-west and Mindolo in the north-west operated jointly by the two mining companies, MCM and KCM. The visible signs of this activity are the two mine tailings and two small tailing dam’s right in the city centre. Besides the large scale mining, small-scale mining of precious stones (emeralds) is also done in the rural part of the district in Chief Nkana’s area (UN- Habitat.2009.P.10).

Just like its physical expansion and growth, the city is now economically diversified with a wide a range of industries. The heavy industrial goods to support the mines are produced in the south (heavy industrial area) while household goods such as food processing (milling, processing of textiles, leather products, detergents, food stuffs such as beverages and other consumer goods) are produced in the north (light industrial area). Trading in retail goods is also very robust and acts as a magnet to attract people and the activities are conducted in the second class trading area (Martindale), small sub-urban shopping centers (e.g. Luambe in Parklands), Riverside, and Kwacha as well as urban markets; Nakadoli, Chimwemwe and Chisokone e.t.c.

The formal retail structure has also been supplemented by large-scale trading in shops (retail stores) which acts as a source of employment. The transport and communication, hotel, restaurant and construction are all sources of employment attracting a large number of people. Furthermore, agricultural activities conducted on the outskirts supplying agricultural products such as maize, ground nuts, sweet potatoes, soya beans, cassava, fruits and vegetables, as well as livestock products (cattle, pigs, sheep, poultry, goats, etc) to the large populace in the city are also some of the economic activities (Interview with Mr. Masuzyo Soko on 10th March, 2009, Buchi Resident).

It was discovered that the decline in the availability of formal wage employment especially in the mines has led to the development of a vibrant informal sector. For instance, the people without practical skills engage themselves in piece work and small scale trading activities such as unregistered and unregulated small scale non- agricultural activities (petty trading, metal fabrication and wood processing) as well as trading of various products (beer, household goods, foodstuffs and charcoal). Those semi-skilled and skilled men with practical skills in carpentry
and metal fabrication earn their living by making household items such as furniture and other usable things for sale. Lastly, the women and children were also found involved in trading at markets as well as quarrying of building stones and sand, selling of cement, and making blocks for sale to earn a living.

Kitwe also acts as the administrative centre for institutions; Public and Private. These include; the Zambia Police and Prisons Service, Social Warfare Offices, Zambia Electricity Supply Corporation (ZESCO), Copperbelt Energy Corporation (CEC), Zambia Revenue Authority (ZRA), Zambia Telecommunications Company Limited (ZAMTEL), Zambia Postal Services (ZAMPOST), Railway Systems of Zambia (RSZ), National Pension’s Scheme Authority (NAPSA), Zambia State Insurance Corporation (ZSIC), Energy Regulation Board (ERB), Zambia National Building Society (ZNBS), Zambia National Broadcasting Corporation (ZNBC), Anti-Corruption Commission and other Government Ministries and Departments e.t.c. The finance sector has not been left behind and financial institutions such as the Zambia National Commercial Bank (ZANACO), Barclays Bank, Stanbic Bank, Finance Bank, Indo Zambia Bank, Standard Chartered Bank, Investrust Merchant Bank and other financial lending institutions and insurance companies all have regional offices in Kitwe.

The city’s education services are offered by an approximate number of 117 institutions of learning; Copperbelt University (CBU), Copperbelt Secondary Teachers Training College (COTSECO), Kitwe Teachers Training College (KTTC), Zambia Institute for Business and Industrial Practice (ZIBSIP), eight government high schools, 47 government middle/basic/upper basic schools, One junior government secondary school, 32 private secondary/primary schools, three Private primary/pre-school teachers training colleges and 23 community schools. Although the city appears to have a lot of schools for basic/middle education, a problem appears to emerge at upper/high school level. The eight government high schools, which are affordable for the majority as opposed to the 32 private schools, are not adequate. For instance, most informal settlements such as Kapoto, Mulenga and Chipata Compounds do not have high schools and pupils residing in these areas have to travel long distance to attend schools located in medium cost residential areas such as Chimwemwe and Wusakile (Interview with Mrs. Mary Tembo. Mulenga Compound Resident. 30th April, 2009).

In terms of health services, the city has three (3) hospitals; Kitwe Central Hospital run by the GRZ under the Ministry of Health, the Nkana Mine Hospital run by KCM and the Wusakile
Mine Hospital run by MCM. There are at least thirty-nine public health centers (clinics) at least one in each township run by the Ministry of Health. Some privately owned health centers were also found operating mostly in the high cost residential areas such as Parklands, Riverside and Nkana East. Traditional medicine is also offered by traditional healers who acquire their remedies from the district forests and these were found operating on most markets of Kitwe.

The Kitwe City Council (KCC) also provides preventive health services through the Department of Community and Health Services, a department that is also responsible for the inspecting of residential, industrial, and commercial premises, refuse collection and malaria control as provided for under the Public Health Act CAP 295 (GRZ. 1994. P.5) (Interview with the Senior Health Inspector, Kitwe City Council, 16th May, 2009).

**History of water and sanitation service delivery in Kitwe**

Since its inception, Kitwe has had two distinctive administrative structures; one falling under the mine and the other, under municipal control providing a range of services. However, the dual structure ended after the privatization of ZCCM in the 1990s and the subsequent takeover of all municipal activities by the KCC as prescribed under the Local Government Act (NWASCO and DTF.2005.P.6).

The history of water supply in the city stems from the time the Nkana mine township was established in the 1920s and the subsequent demand of water for mining and domestic activities. The historical notion of water supply by the then mines was that of overhead capital and not for profit making. After the establishment of the council to manage the affairs of Kitwe city, a dual structure came into existence with ZCCM supplying water to mine townships (Nkana East/West, Chamboli, Miseshi, Mindolo and Wusakile) while the municipal council supplied the rest of the residential areas (Buchi, Chimwemwe, Parklands, Riverside, Ndeke, Bulangililo, Kwacha, Parklands, Riverside and Race Course e.t.c) (Mutale.1978. P.113).

However, the delivery of water and sanitation in Kitwe has undergone a lot of changes particularly due to the collapse of the economy and subsequent privatization of ZCCM. The major development in the sector was the establishing of the Nkana Water and Sewerage Company (NWSC) from the former Water and Sewerage Department of the Kitwe City Council to meet the high demand for water and sewerage services (Interview with the Branch Manager, Riverside Zone, Nkana Water Sewerage Company on 10th June, 2009).
However, it is important to note that immediately after the privatization of ZCCM; there was a slight change in the sector which saw the creation of Asset Holdings Company - Mining Municipal Services (AHC - MMS) to supply water to all mine townships. This company provided subsidized water and sewerage charges with financial assistance from World Bank to the ZCCM - Investment Holdings Limited (ZCCM - IH) (AHC - MMS, 2003.P.10). However, the project was short-lived up to 2006 and currently the Nkana Water and Sewerage Company has entirely taken over service provision in all mine areas. It was also found that, despite having a treatment plant, the two mining companies MCM and KCM do not provide any water and sanitation services to the residents of Kitwe for domestic, except the areas within the mine plant for mining activities.

**Conclusion**

The city of Kitwe is one of the fastest growing cities in Zambia. This chapter provided the historical development and the origin of its informal settlements. The demographic profile and housing were discussed by assessing how the location of residential areas and physical characteristics of the house designs impacts on their expansion, renting practices, overcrowding and duration of stay.

The social-economic profile of Kitwe was discussed before presenting a section on the provision of basic services such as education, health and administration. The general discussion on the history of water and sanitation service delivery in Kitwe has been presented in the last section. Furthermore, the chapter has not presented findings on the nature and extent of the inadequacies in water and sanitation service delivery and access, the main focus of the findings in Chapter three and four.
REFERENCES


29
CHAPTER THREE
THE NATURE OF WATER SUPPLY AND ACCESS

Introduction
This chapter examines the nature of water supply and access in the high density areas of Kitwe City. The qualitative and quantitative data that was used were obtained from the residents of Kapoto, Chimwemwwe, Buchi, Mulenga, Chipata and Wusakile, the Kitwe City Council (KCC), Nkana Water and Sewerage Company (NWSC) and other stakeholders. The first section discusses the nature of water supply services by examining, “in-house, yard taps, communal taps and water kiosks”. The services related to the provision of piped water supply are discussed in the second section.

The availability and the level of customer satisfaction with the services provided by the Nkana Water and Sewerage Company are explored in section three. In this section, regularity, reliability, quantity and quality of water supply are examined. These assessments also helps in understanding value issues; factors that cannot be costed directly in terms of money/time but affect how much value households place upon a particular source of water. In the same section, the geo - spatial issues of distance, congestion, security and transport are discussed. This explains why households make decisions in choosing one water source from the other.

The third section discusses the extent to which residents are able to afford accessing water services. The discussion assesses the costs that a resident has to incur from the time of installing water facilities (a tap or meter) (at the community/household level), maintenance and paying of water tariffs and maintain water facilities. This is followed by an analysis of how maintenance costs, tariffs, “bills’, time costs, bribes and any other facilitation payments/extra costs associated with a particular nature of a water delivery method affect affordability. The reasons behind low service coverage and connection rates in the informal settlements as well as the capacity of the Nkana water and Sewerage Company were also investigated.

The nature and extent of water supply services in the high density areas
This section discusses the types of water services being provided by the Nkana Water and Sewerage Company (NWSC) in the selected high density areas of Kitwe. Here, four types of piped water supply services are examined and the first was in-house water connections. This involves accessing water through a tap located inside a house and the residents with this service
were found in Chimwemwe (21) and Wusakile (8) representing 29 (9.6%) of the households. The second service is the use of yard taps, a tap not located inside a house but outside and accessed within a household residence. This category of residents comprised the majority 106 (35%) residents and the distributions of these are Chimwemwe 29, Wusakile 12, Buchi 47, Kapoto 7 and Chipata 8 (See Chart .3.1).

Chart.3.1. Distribution by type of water source

![Distribution by type of water source](chart.png)

Source: Compiled from field data

The third piped water service comprised communal taps which are used by 30 (10 %) of the sampled residents and all of them were found in the mining town of Wusakile. This facility is a communal water point located at the centre of a community and shared by households within a community. Since a communal tap is not located on individual residences households using this service have to walk a distance of approximately 500 meters away from their residence to draw water. The fourth service comprised water kiosks. Water Kiosks are defined as stationary vending locations staffed with kiosk attendants where households purchase piped water in cash as the source of water (Manda. 2007. P.45). It was discovered that the residents using this service comprised the minority 15 (5%) of the residents and these came from Kapoto (7) and Mulenga.
Like their counterparts using communal taps, residents using water kiosks also walk a distance of approximately 500 meters away from their yards to draw water.

The provision of “in-house water connections,” “yard taps,” communal taps” and “water kiosks”, in the high density areas of Kitwe is done by the Nkana Water and Sewerage Company. It was established that accessing any of this service is dependant upon the physical methods of delivery, house designs and affordability.

The residents using in-house connections have their houses designed to accommodate a tap inside a house. On the contrary, those using yard taps have their houses with designs that cannot accommodate in-house water connections. However, despite the differences, households accessing the two services have similar advantages which include being able to manage water usage i.e. avoiding the accumulation of water bills and able to protect water infrastructures (taps, meters and pipes) from being vandalized. Accessing water through these methods also reduces time costs, distance, transport and guarantees reliable water of good quality residences.

It was found that the use of communal taps is also influenced by household location. The residents using this service were found in the sections of Wusakile which did not benefit from the project to replace communal taps with yard taps in 2005 by the Devolution Trust Fund (DTF). Instead, these make use of communal taps located at an ablution block comprising (accommodating) a communal toilet which is owned by the NWSC. However, the maintenance of this facility is in collaboration with CBOs and RDCs in communities where they are active (Interview conducted with the Branch Manager, Chimwemwe Branch, Nkana Water and Sewerage Company on 6th April, 2009).

The communal taps were shared with ten households located within the vicinity of an ablution block that houses a communal toilet. The residents share in the payment of water bills and each household contribute a monthly bill of K29, 000 for using this facility. Where they are active, the RDCs and CBOs collect money on a monthly basis from households on behalf of the service provider; the NWSC to pay water bills. On the contrary, in communities where the RDCs and CBOs are inactive, the NWSC sends field agents to collects water bills from individual households. These are the same communities where complaints on cooperation over the paying of water bills and conflicts over the responsibility on maintaining water infrastructures i.e. a tap were found.
It was established that the use of water kiosks was not influenced by house designs but instead it is determined by affordability, a household ability to purchase water in cash from the kiosks which are owned and operated by the NWSC. The kiosks were installed to increase access to piped water supply to residents living in informal settlements where service coverage and connection rates are low. They were installed by the NWSC Peri - Urban Water and Sanitation Program with funding from the Devolution Trust Fund (NWASCO.2008.P.9). However, it was discovered that not all informal settlements have kiosks. Kapoto and Mulenga Compounds were the only study areas were residents were found accessing this service and the beneficiaries indicated that it is the most convenient source of piped water presently available to them. Mrs. Bertha Chilufya supported this by saying that “water kiosks are pro-poor, manageable if a household is able to afford to purchase 20 liters container of water at a price of K25 with no up-front payment, connection fee and monthly bills (Interview with Mrs. Bertha Chilufya, Mulenga Compound Resident on 8th July, 2009).

Generally, the residents accessing water services from the NWSC indicated that piped water supply is fairly convenient in terms of accessing clean water for drinking and other household chores (cleaning, washing, bathing and sanitation). They added that this service necessitates the provision of waterborne waste disposal facilities (on-site septic tank, etc) or off-site (sewer network or communal wastewater collection or treatment facility) the services that require water (Interview with Mrs. Musonda Kalimanshi, Chimwemewe Resident on 4th March, 2009). However, from the analysis it can be deduced that access to each type of piped water supply depends on the level of service coverage, availability and affordability and this had led to low access as evidenced by the 120 (40%) of the residents in Chipata (42), Mulenga (43) and Kapoto (35) who do not have access to piped water supply but instead use hand dug wells as the alternative source of water.

Again, the use of hand dug wells was influenced by affordability, if a household is able to afford the cost towards service connection from a water grid to the house, install a tap or purchase water in cash from a water kiosk. Furthermore, it was also discovered that affordability was not the only factor that influenced the majority 120 (40%) residents in the informal settlements to use hand dug wells, but there was also reluctance by households to connect to the existing water grids. This was evidenced when a comparison was made on the number of existing water grids against the number of households connected to each grid. Chipata
Compound despite having three water grids had few households connected to each grid implying the reluctance to connect to access piped water. Furthermore, the cost towards water connections (cost of installation, pipes and a tap) was found to be manageable if shared by landlords and any other would be users i.e. renters and neighbors and therefore cannot justify the failure to connect to a water grid that is readily available.

When asked about their preference of using hand dug wells, most of them indicated that the wells are cheap, made simply as excavations by digging through an underground aquifer using picks and shovels to access water. They also indicated having a hand dug well is manageable because it does not require costly equipments such as cost of installation, water pipes, a meter or a tap and to draw water they indicated only using a simple rope and a bucket.

**Services related to the provision of water supply**

The Nkana Water and Sewerage Company manage the complete water supply system or the waterworks (pumping stations, treatment stations, or storage facilities) in Kitwe (NWSC.2007.P.2). However, there are also other additional related services apart from the supply of water through “in-house connections,” “yard taps”, communal taps” and “water kiosks” to residents. Firstly, the company has a policy of maintaining the continuous supply of water, 24 hours a day while observing normal water pressure and flow in line with the guild lines of the regulator, the National Water Supply and Sanitation Council (NWASCO.2005.P.15). It was found that due to high demand, the company supplies water on an average of 16 hours per day for the purpose of rationalizing supply in high density areas. Furthermore, under certain circumstances, the company also carries out interruptions, postponements or limits water supply when there are system damages arising from pipe bursting, blockages or breakdowns; when its necessary to inspect, maintain, repair or replace any part of the system; during the connection of new works and when events such as acts of vandalism, civil commotion, power shortage or industrial action occur.

The study found that the Nkana Water and Sewerage Company carries out service interruptions when there are periods of declared water supply restrictions in the event of a situation arising that entitles the disconnection of supply or where the company deems it fit that providing this service will pose a significant health risk. Except in emergencies and in situations where interruptions are limited to a short duration, the company gives customers at least 24 hours
notice of the need to interrupt, postpone or limit the supply of services for regular maintenance or works programs. The reason why this is done is to enable customers to understand that regular maintenance works on infrastructure is essential for ongoing supply (Interview with the Company Engineer, Nkana Water and Sewerage Company Engineer on 18th January, 2009).

The research established that for unplanned or planned interruptions, the company makes a reinstatement of service a priority and does all within its power to restore the service as quickly as possible. To reduce cases of customer complaints, the company also sends its field agents to investigate complaints of low pressure, quality and damage to infrastructure to enhance continuous supply. This has also been necessitated by the installation of monitoring equipment on raw water pumps, high lift pumps, reservoirs and treatment plants (Bulangililo and Kafue Water Treatment Plants) where operational data are transmitted via radio to a computerized monitoring station “Status Monitoring Systems”, for the early detection of faults. Through such mechanisms, events causing significant water loss or property damage are detected as soon as possible and all repair work of less urgent nature is usually undertaken as staff and resources become available (Interview with the Branch Manager, Ndeke Zone, Nkana Water and Sewerage Company Water Engineer on 18th January, 2009).

The study found that the Nkana Water and Sewerage Company have an effective system that ensures that customer complaints are attended to within time. The establishing of zone offices in Wusakile, Chimwemwe, Buchi and Ndeke has necessitated the mechanism for customers to forward comments, enquiries, complaints, suggestions, faults reporting and payment of bills. The use of ICT facilities (telephones, cell phones, telexfaxes, radios, newspapers, e-mails, televisions and mobile vans equipped with megaphones e.t.c.) has helped the NWSC to facilitate communication. For instance, the radio, television, newspapers and mobile vans equipped with megaphones are frequently used to remind customers to pay water bills, any future water interruptions or development in service provision. The formulation of water watch groups, community focus groups, customer surveys, school based education initiatives, touring of water points and educating communities has also helped to enhance participatory decision making and customer interactions in improving service delivery (Interview with the Branch Manager, Riverside Zone, Nkana Water and Sewerage Company on 27th January, 2009).
The Nkana Water and Sewerage Company have set up rules and regulations that specify customer expectations for the piped water services that they receive. Firstly, there is a rule that relates to the maintenance of water infrastructure (pipes and meters) and this stipulates that if the company investigates that the source on water supply relates to a customer’s reckless destruction of pipes located within their premises, the customers are required to hire plumbers at their own costs to rectify the problem. Again, if the company discovers that the problem is as a result of a customer’s defective or improper work, then a notice will be served requiring the customer to remedy the situation within a set time. If the terms of the notice are not followed, the company’s representatives may remedy or enter a private company to remedy the defective or improper work. If the company takes this action, the customer will be charged the full cost of any remedial work and if all methods fail then the company reserves the right to take legal action if appropriate (Interview with the Company Secretary, Nkana Water and Sewerage Company on 18th January, 2009).

The study established that the company forbids residents not to cover, interfere, or otherwise alter any water supply infrastructure without its prior approval. If such a case occurs, residents are advised that they will be liable for the total costs of rectifying damages if it’s located on or dedicated to their property. If the company rectifies this problem, the customers are informed that the costs will be recovered from the person or persons that has caused such damages or from the owner of the property on which the infrastructure is located.

However, there are also rules and regulations that allow customers’ responsibilities to repair and maintain services. This applies to situations where customers are allowed to remove any obstructions such as trees that can prevent reasonable access to water facilities (pipes, meters and taps). The residents are also advised that the company reserves the right to restrict the flow of water to the property and/or disconnect water supply service if the customers do not pay or make arrangements to pay overdue charges for services or comply with imposed water supply restrictions (Interview with the Supervisor, Bulangililo Water Treatment Plant, Nkana Water and Sewerage Company on 2nd February, 2009).

The availability and affordability of water services and level of customer satisfaction
We have seen that the provision of piped water supply and other related services in the high density areas of Chimwemwe, Buchi, Kapoto, Mulenga, Wusakile and Chipata exist. However,
the presence of these services does not mean that it is sufficient, residents are able to afford pay the water bills, able to maintain water infrastructure (pipes meters/taps) and are satisfied with service provision. From this point, this section assesses the availability of water services, affordability towards the costs of accessing piped water supply and the level of customer satisfaction among residents accessing water services from the Nkana Water and Sewerage Company.

Majority 160 (53%) of the residents with access to piped water supply indicated dissatisfaction and only 20 (6%) indicated satisfaction with availability (See. Chart .3.2). The investigation on availability looked at finding out if the water supplied to residents is of prescribed minimum standard required for use. It involved finding out how regular and how reliable is the water supply to households, what quality and sufficiency it is. In terms of assessing availability, most residents complained of intermittent water supply through various service interruptions. There were complaints over the duration or time when they receive water supply in a day.

Chart.3.2. Percentage Distribution of the levels of satisfaction with the availability of water supply services

The intermittent water supply was also expressed in terms of unnoticed water cuts which led to prolonged water shortages. According to most residents, this was as a result of the poor
water reticulation systems which experience frequent pipe failures, operational problems at water reservoirs, treatment plants and distribution centers as well as poor response times. The problem of reliability/regularity affected availability in terms of adequateness (length of time at full-service) which can be used to determine whether a tap (as a proxy for a direct connection) is serving a household to their fullest needs. If the supply is not adequate, it has negative effects such as resorting to the use of other alternative sources of water such as the hand dug wells because residents are not receiving the water that is required for all household chores (Mulenga et al 2000, P.9).

The responses of the residents not satisfied with regularity/reliability show that 117 (65%) majority were not satisfied, 36 (20%) are reasonably satisfied; while only a tiny minority 27 (15%) indicated satisfaction (See Chart. 3.3). To support this, evidence revealed that the residents of Chimwemwe and Buchi indicated receiving water between 05:00 - 09: 00 hours and 21:00 - 05: 00 hours, while those in Wusakile indicated receiving water between 07: 00 - 10: 00 hours and 14: 00 - 21: 00 hours. It was found that the response was different from the residents in Kapoto, Mulenga and Chipata who indicated not having fixed time intervals in terms of water supply. Instead these indicated that the water supply is interrupted without notice everyday and there is no reliable fixed time and sometimes they encounter prolonged water interruptions that last for more than 24 hours.

**Chart.3.3. Percentage Distribution on the levels of customer satisfaction with regularity/reliability**

![Pie Chart](chart.png)

Source: Compiled from field data.
It was also discovered that the residents using water kiosks in Kapoto (7) and Mulenga (8) are also affected by reliability and this is attributed to poor kiosk management. They complained of water interruptions because kiosks operate only for 8 hours a day (five hours in the morning and three hours in the afternoon) and remain closed overnight. This is made worse during the weekends when the kiosk attendants are off duty and they have to wait until Monday to re-open. The only kiosk where this did not occur is in Kapoto where a community based organization for women manage the kiosk in collaboration with the kiosk attendants. This kiosk was also found to be a hive of activities and a meeting point for community meetings and where household goods such as detergents, sweets, biscuits, drinks are sold (Interview with Mrs. Martha Sitali, Kapoto Compound Resident on 6th May, 2009).

The other factor that affects availability is the quantity or the amount of water required by a household to use for various chores such as drinking, cooking, cleaning, washing, bathing, flushing toilets and watering gardens etc. 90% of the residents complained of receiving water of low pressure and consequently low quantity. These complained of receiving water of low pressure which had negative effects such as, increasing the cost of accessing water services because they have to buy storage facilities such as a water tank, plastic buckets or a reused chemical drum.

The complaints over low quantity was also expressed by the residents using communal taps and kiosks who indicated incurring extra costs involved when ferrying water to their households in order to meet the required volume for use. This is supported by (Howard et al. 1994. P.11), who puts it succinctly that “supplying of low quantity water has significant health effects; an extra cost that they have to incur on medical expenses because reduced quantity strongly affects access, cost, transport, distance to the point of delivery, maximum storage volume, reliability and regularity”. This is true, especially at the low end of the consumption spectrum (households), adequate water (high quantity) use is important not only for proper hydration but also for maintaining general cleanliness, which can prevent a host of debilitating diarrhea diseases such as cholera and dysentery.

The quality of drinking-water is a powerful environmental determinant of health. To this effect, the study also assessed perceptions on the quality of water among residents. Majority of the residents (90%) indicated receiving poor quality water while only a minority indicated receiving water of somewhat good quality. The perception among residents with regards to
quality was mostly related to them linking taking water of poor quality with becoming sick with water-borne/diarrhea diseases such as cholera, dysentery and stomach pains. The other perception was on the bad color and smell of the water coming from the taps in the mornings and worse everyday during the rain season (Interview with Mr. James Sikazwe, Buchi Resident on 4\textsuperscript{th} May, 2009). Such water is perceived not safe to drink because silt was seen at the bottom of a container when the water was made still and not shaken for along time. Although, the NWSC indicated that it was safe to drink it normally entails boiling or adding chlorine to it to make it safe to drink which is costly.

The geo-spatial issues of distance, congestion, access, security and transport also affected the availability. However, these factors only affected residents using water kiosks and communal taps. Firstly, the problem of distance was discovered to be a co factor of access, security, transport and ultimately a time cost because of the interactions and the physical realities of water (very heavy, difficult to move, etc.). This is because distance determines what type of water is used, what percentage of household income is spent on water, and how much water is used. This is supported by (Graham. 2005. P.42) who puts it that, “distance and transport, which are linked closely, affect both time costs and the quantity of water available, among other factors; whereas access, security, and the competition/congestion issue are more centered on the location of the water source itself”.

It was therefore established that the residents using communal taps and water kiosks are all affected by distance and time costs, because they draw water from taps located outside their yards and have to walk more than 500 meters. The distance in this study includes specific surroundings (as well as travel paths) to water sources and to access water which brings non-spatial components of security, transport and congestion. Distance itself was taken as the effort required to access water and the time spent to draw water outside a residence, a cost which is real and presents effective hindrances in the availability of water. Related to distance was the other geospatial issue of transport; moving of water drawn from communal taps or kiosks to a house. The reason transport was found more linked to distance was because it depends upon distance to reach a water source. Therefore, transporting water through any means whether its paying people to carry or using wheel burrows and purchasing containers to store water affects the cost of water, the volume of water consumed, storage issues, etc (Interview conducted with the Water Kiosk Attendant in Mulenga Compound on 4\textsuperscript{th} February, 2009).
Security was another geospatial issue that affected access and later availability. Security affects availability because it can determine when and how water is to be collected i.e. is it with other women only when in groups or only during a certain period by those using water kiosks and communal taps? Security here is taken to imply, the physical safety of people, as they move between households to draw water to sources located far (500) metres away from residences. This included factors ranging from the very real concern for one’s life and the safety while collecting water because not only are communal taps or kiosks located in unsafe places, their locations require individuals to pass through unsafe neighborhoods or by unsafe places (such as a bar). Furthermore, security was found strongly gendered on women and children because these are the primarily collectors of water and quite often do not receive help from their adult males. Hence, as they collect water, security usually means protection from men and this can range from low harassment and generally feelings of unease to physical attacks and abuse. (Interview conducted with Mrs. Judith Chanda, Wusakile Resident on 5th April, 2009).

The study also examined affordability and how it determines access to piped water supply. Affordability was investigated in terms of how fair or unfair the water tariffs are. These are the prices charged per volume for water through meters (in-house and yard taps), flat time-based tariff (fee per month) (yard taps), and a block tariff by volume (rising or falling) in communal taps (World Bank.2003.P.13). It was found that the majority, 60%, were not able to afford the water bills and other extra costs associated with piped water services while only 40% were able to do so (See Chart 3.4).

Chart.3.4. The percentage on affordability for water services

Source: Research data
In terms of how fair the billing system is, both the metered and unmetered residents indicated that they were not fair because what they pay is not equivalent to the services they receive. For instance, they complained of intermittent water supply, unnoticed water interruptions and prolonged water shortages. The residents also complained of being supplied water of low quantity and poor quality which does not match the water bills coming out every month. Furthermore, poor response to customer complaints over pipe breakages, replacing of damaged infrastructures such as the meters or pipes that sometimes took too long to repair are some of the perceptions by households on how unfair the service charges are.

Another factor that was identified to be affecting affordability are the maintenance costs or the occasional or semi-regular costs that are necessary for the consumer to continue the benefit of the particular type of water service. These are costs incurred in replacing broken parts and time spent on burying pipes uncovered by heavy runoff (or the assumed cost of replacing the pipes if they are not re-buried and then subsequently broken. The cost of maintenance is costly, especially in situations where pipes are buried at shallow depths, experience frequent pipe breakages and need replacement. However, it was also found that these costs only applied to residents who are supplied with water within their residence (those using in-house connections and yard taps), unlike those using communal taps and water kiosks whose maintenance of such facilities is the responsibility of the Nkana Water and Sewerage Company.

It was discovered that there are also other associated costs that comes with receiving water services at individual residences. These costs are mostly related to payments made to purchase a service or merely to facilitate the installation of infrastructure, or even to overlook illegal connections to a pipe network. The fees and the power structures that underlie these costs can be difficult to measure, but can add significantly to service delivery (World Bank. 2003. P.23). The complaints over bribes is an example of such a cost that was found and while bluntly described here as “bribes,” it really includes any “facilitation payments” which are not official. For instance, households with metered water services accused meter readers of corruption because they often falsify readings and ask for bribes which increase the nominal cost of water at the expense of the water utility. The other bribe related payments include those made to utility workmen to expedite repairs or to expedite new connections and such payments definitely increase the nominal cost of water by a household (Graham. 2005. P.44).

The other associated costs are what can be called startup costs or those charged to get
water connection at individual residences. These costs include; water connection fees, costs associated with the purchasing of water pipes that require covering long distances to the few existing water grids to households in the informal settlements were service coverage is low. These costs affected the 120 (40%) residents in Kapoto, Mulenga and Chipata who do not access any form of piped water supply and instead have resorted to using hand dug wells as the alternative sources of water

**Conclusion**

The purpose of this chapter was to investigate the nature of water supply and access in the high density areas of Kapoto, Chimwemwwe, Buchi, Mulenga, Chipata and Wusakile. The first section investigated the type of piped water systems; “in - house connections, yard taps, communal taps and water kiosks. The section that followed presented a discussion of other related services provided by the NWSC.

The third section investigated availability and affordability as well as the level of satisfaction among the residents accessing water services. In this section, regularity/reliability, sufficiency and quality were investigated. The geospatial issues (distance, security and transport) and how these affect availability were also discussed. Lastly, affordability in terms of how residents perceive the cost of water tariffs, connection fees, maintenance and other associated costs were also assessed before presenting the number of households not accessing water supply and using hand dug wells as alternative sources.

As a result, it was found that, indeed the problems of water supply and access have not been abated; in some respects they are worse, because a number of problems exist as discussed in the chapter? Having provided findings on the nature and extent of water supply and access, chapter four will endeavor to establish the nature and extent in the inadequacies in solid waste removal and access to sewerage services by the residents in Kapoto, Chimwemwwe, Buchi, Mulenga, Chipata and Wusakile.
REFERENCES


CHAPTER FOUR
THE NATURE AND EXTENT OF THE INADEQUANCY IN SOLID WASTE REMOVAL AND ACCESS TO SEWERAGE SERVICES

Introduction
The chapter discusses the nature and extent of the inadequacy in solid waste removal and access to sewerage services in Kapoto, Chipata, Mulenga, Buchi, Wusakile and Chimwemwe. Qualitative and quantitative data used in the study came from the residents in the surveyed high density areas, the Kitwe City Council, Nkana Water and Sewerage Company and other stakeholders. To start with, the first section examines solid waste removal in the high density areas by identifying the service providers. The capacity of the Kitwe City Council and the Private Waste Collectors in carrying out solid waste collection, transportation and disposal, as well as the provision of door-to-door waste collection, collection of waste at communal waste points and market dumpsites are discussed.

The second section assesses the level of satisfaction with service provision by the Kitwe City Council and the Private Waste Collectors. The satisfaction towards door-to-door waste collection, collection of waste at communal waste points and market dumpsites is next analyzed. The effects of the inadequacies in solid waste removal are assessed before discussing the alternative methods of solid waste disposal used by residents. The last section discusses the provision of sewerage services and here, the types of sewerage services (flash in toilets, flash out toilets and communal toilets) and the beneficiaries are investigated. Further, the level of satisfaction among households and the capacity of the Nkana Water and Sewerage Company in providing sewerage services are explored before discussing the use of pit latrines as the alternative methods of human waste disposal.

The nature and access to solid waste removal services in the high density areas of Kitwe
Until the mid 1990s, the Kitwe City Council singly carried out solid waste removal services in Kitwe. In the early 2000s, the appalling performance of the KCC and the demand for municipal solid waste removal attracted the private sector. It is now estimated that there are at least 10 private companies engaged in solid waste collection services in the city. Their involvement started in 2001 after the signing of a memorandum of understanding with the council, specifying
the operational rules and regulations (Kazimbaya et al. 2000.P.5). While they carry out solid waste removal in different parts of the city, the council performs the role of monitoring their performance and ensures that they fulfill obligations to clients. However, the private waste collectors that were found operating are companies such as Cop waste, Kasusu, Katron and Maritime and these are the only recognized waste management companies by the council (Interview with the Senior Health Inspector, KCC on 4th June, 2009). It was found that 80 (27%) surveyed households receive solid waste removal services from the public sector through the KCC. Only a tiny minority of 10 (3%) receive these services from the private sector through the private waste collectors. It was also found that the 210 (70%) comprising the majority do not access any form of solid waste removal services (See Chart.4.1).

**Chart.4.1. Frequency on the type of service providers with regards to solid waste removal**

![Chart showing frequency of service providers](image)

**Source: Compiled from field data.**

Although, the council and private waste collectors are the principal providers of solid waste removal, a small number of other actors, including some industries and bulk generators collects and dispose waste themselves. The majority of the residents served were found in the planned residential areas of Chimwemwe, Buchi and Wusakile. Even the KCC, which is mandated to provide solid waste removal services to residential areas, concentrates its efforts on residential areas and institutions that can afford service charges and residential areas inhabited by
the poor in the informal settlements are never serviced (Khonje et al. 1992. P.6)

It was discovered that the methods of waste collection was the most distinguishing factor between the Public and Private Sector in Kitwe. The council provides the collection of waste through door-to-door (yard/doorstep) (at a fee) and on communal waste points and market dumpsites collection (for free). On the contrary, the private waste collectors only offer the collection of waste at residences (yard/doorstep) (at a fee). These indicated not offering communal waste point or market dumpsites collection (for free) because they are profit oriented and not mandated by law when compared to their counterparts, the council (Interview with the Head of Refuse Collection, Kasusu Waste Management Company on 12\textsuperscript{th} February, 2009).

The two types of service providers are all involved in the collecting, transporting and disposing of waste as inherent services aimed at ensuring that the waste stored at the source is collected regularly and disposed to final sites and not on the streets, storm drains, open spaces and water bodies, etc. These services are conducted in order to complete the cycle of waste removal which (Gombya. 2005. P.173) views are the functional element of waste collection and involve not only the gathering of wastes, but also the transportation of waste, after collection, to the final disposal. It was discovered that the service providers use the “Uchi dumpsite”. This site is the only recognized legal dumpsite in Kitwe. The dumpsite is managed by the council who charge a fee upon weighing the amount of the waste being disposed there and it is regularly bulldozed/ leveled with some form of engineering and gas management measures. Otherwise, most dumpsites being used as final disposal sites, such as those found on the outskirts of Chimwemwe and Kapoto have been classified as being illegal by the council (Interview with the Head of Refuse Collection Copwaste Company on 22\textsuperscript{nd} April, 2009).

Although door-to-door waste collection is considered as the most convenient method, it was found that only 25 (8\%) residents from New Chimwemwe and Wusakile’s sections E and T indicated receiving this service (See Chart 4.2.). The service involves the use of pick-up trucks, open bodied trailers, tippers and tractors going around the streets where customers are located to collect waste. The service provider’s waste collectors sometimes even use an alarm to alert the residents to bring their wastes outside their yards (in bins, black plastics or containers) ready for collection. The other crew members unload wastes, put them in the collection trucks and return the bins, black plastics or containers and when the truck is full, waste is transported to final disposal sites (chutes) (Interview with a Waste Picker, Maritime Waste Management Company
on 4th May, 2009). However, it was found that no resident in Kapoto, Chipata and Mulenga indicated receiving this service because such a service is not provided in the informal settlements by both the council and the private waste collectors.

Chart 4.2. The Distribution of Respondents by the methods of solid waste collection services

<table>
<thead>
<tr>
<th>Method of Collection</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to door waste collection</td>
<td>8%</td>
</tr>
<tr>
<td>Throw waste on communal waste points</td>
<td>12%</td>
</tr>
<tr>
<td>Throw waste on market dumpsites</td>
<td>10%</td>
</tr>
<tr>
<td>Receive no service</td>
<td>70%</td>
</tr>
</tbody>
</table>

Source: Compiled from field data.

The other waste collection services, throwing waste at communal waste points and market dumpsites are ranked second and third respectively (See Chart 4.2). From the study 36 (12%) residents from Wusakile (17), Chimwemwe (14) and Buchi (5) use communal waste points while 30 (10%) from Wusakile (11), Chimwemwe (6) and Buchi (13) use market dumpsites as the method of waste disposal. This service is only accessed by the households residing near communal waste points and market dumpsites and all what they require is to put waste in a 25kg empty bag, transfer it on a wheelbarrow to such waste points later to be collected by the council. The benefit of these services is that they reduce the problem of throwing waste on open spaces and on the streets in residential areas where the services are offered.

With the council’s appalling performance and the failure of private sector to extend into low-income and unplanned settlement areas, community-based initiatives in waste collection, transportation, storage, trading and recycling started to emerge in the 2000s (KCC/ECZ.2000.P.7) There are now a number of CBOs, RDCs, charitable organizations, self-
help groups and neighborhood associations who are generally playing a role in solid waste removal. These offer services such as, transferring waste generated by households to final legal dumpsites at a monthly fee of K10, 000 in Chimwemwe and Wusakile (Interview with Mr. Mumba Kapeso. Chimwemwe Resident. 10th May, 2009).

Furthermore, many informal agents (waste pickers, traders and dealers, itinerant buyers, informal dump service providers and informal recycling enterprises) are also involved in Kitwe’s solid waste removal, albeit as a secondary activity. These actors are very helpful in addressing the problem of solid waste removal because they are involved in all MSWM domains, including waste collection, separation, storage, re-use, recovery, recycling, trading, transport and disposal (Matenga et al. 1999.P.5). They were found helping to reduce accumulated heaps of garbage that require disposal, more significantly, in non-serviced areas inhabited by the urban poor such as Kapoto, Chipata and Mulenga compounds where there is no service coverage at all even at market dumpsites despite being there.

**The extent of satisfaction with the solid waste disposal services**

The type of solid waste removal services being provided in Kitwe has been presented in the previous section. In general, the residents are not well served because the services are either erratic or not provided. From the data analyzed, it was established that out of the 90 (100%) accessing solid waste removal services, the majority 66 (72%) indicated dissatisfaction, 20 (22%) indicated somewhat satisfied while only a tiny minority 4 (4%) indicated satisfied with the services (See Chart.4.3)

The households receiving door - to - door waste collection indicated not satisfied and gave three main reasons. Firstly, they complained of poor, unreliable services characterized by high service charges which do not match service delivery. They also complained of low waste collection frequency and poor response to customer complaints from both the KCC and Private Waste Collectors. For instance, these residents complained that the waste collectors from the service providers do not collect waste on time i.e. weekly basis as agreed upon in the actual contracts. As a result, those able to afford, indicated reluctance to engage the service providers because of previous disappointments with the poor services in the past and would therefore not re-engage them on new contracts (Interview with Mr. John Daka, Buchi Resident. 4th May, 2009).
Chart 4.3. The Distribution of Responses by satisfaction with solid waste removal services

Source: Compiled from field data

The residents throwing waste on communal waste points and market dumpsites without service charges had their level of satisfaction also examined. They also indicated not satisfied with the services because of irregularities and long delays in the frequency to collect waste by the KCC which sometimes would last for more than a month. This has a negative effect such as the spilling and decomposing of uncollected heaps of waste which impacts negatively on environmental health. With no proper management, the uncovered and open dumpsites act as the breeding ground for flies, rats and insects. Furthermore, animals such as dogs also drag and ruckus the uncollected waste back to residential areas which are a health hazard. The dumpsites are also a health hazard to children who like playing on them, as well as the waste collectors/pickers who are highly susceptible to diseases because they lack access to low cost or free protective gear, such as gloves, boots, and clothing to prevent contact injuries and reduce pathogens (Interview with the Head of Refuse Collection, KCC on 12th June, 2009).

The key to any successful waste removal program are waste collection vehicles, equipment, employees and financial resources (KCC/ECZ.2000, P.12). The inadequacy in solid waste removal has been worsened by the lack of capacity by the council in terms of the required
resources to undertake the removal of solid waste in all the high density areas. In terms of the needed equipment to carry out this activity, the council only has three tractors, two tipper tracks, two flatbed trucks and a front-end loader which are also shared with the other departments within the council. These equipments cannot meet the high demand for solid waste removal and there subjection to regular use in very harsh local conditions leads to frequent breakdowns (Interview with the Councilor, KCC, Chimwemwe Ward on 2nd September, 2009). The non-functioning of these equipments over a long period of time and the lack of spare parts to repair them immobilize solid waste removal, a situation which is not satisfactory especially that solid waste removal depends on frequency and amount of waste (volume) that is collected.

Kitwe, like other developing world cities, is characterized by rapid population growth and urbanization. The city has a population estimated to be one million people who are generating substantial amounts of solid waste (UN - Habitat. 2009. P.9). Although the council budgets enormous amount of funds on recurrent and development expenditures on solid waste removal, the problem still persists. The increase in population has led to an increase in the amount of waste that is generated requiring collecting, transporting and disposal.

It was also discovered that the population increase and the poor planning of residential areas with impassible (inaccessible) roads or alleys make the problem of solid waste removal more acute. Most of the study areas were found with narrow roads, sloppy and congested with street vendors, making it difficult for vehicles to pass through and collect waste. Besides the physical constraints of high population, the common practice of using paper, plastic, glass and metal materials generated in large volumes has made it very difficult to remove waste. As a result, waste removal in Kitwe was discovered to be too tedious, expensive and time consuming resulting in the build up of uncollected filth in the high density areas (Interview with the Head of Department, Community Health Services. KCC on 4th June, 2009).

The investigation behind low service coverage revealed that Kitwe City Council has operational inefficiencies. These range from inefficient institutional structures, inefficient organizational procedures and deficient management capacities (KCC.2008.P.6). Several key impediments stemming from the lack of an institutional and legal framework to support service provision were identified. Firstly, the council does not have a unit to specifically deal with solid waste management when compared to other council’s such as the Lusaka City Council. Instead, such an important activity is managed under the Community and Health Services Department
where resources have to be shared with other units. Furthermore, the KCC does have a deliberate policy put in place to compel the corporate sector have a social responsibility in addressing the problem. The lack of involvement by mining companies such as the KCM and MCM to assist the council address this problem is a good example. Further, the lack of policy frameworks to support public awareness and attitudes, fight corruption in the council and end conflicts between the politicians, council and local people make solid waste removal unattainable (Interview with Mr. Derick Sinyangwe. Wusakile Resident on 6th May, 2009).

The low service coverage and inadequate service provision was reflected in the responses of the 210 (70%) majority residents who indicated not accessing solid waste removal services. These respondents came from Kapoto (50), Mulenga (50), Chipata (50), Wusakile (14), Buchi (28) and Chimwemwe (18) (See Table. 1). With regards to service coverage in the informal settlements of Kapoto, Mulenga and Chipata, the private waste collectors said that these areas were economically unviable. They said that since their core business is profit making, they cannot extend service provision to these areas because they know residents cannot afford service charges. They also indicated that the areas are accessible for vehicles to reach them and the congestion from poor planning of houses pose a serious challenge to collect waste. Furthermore, the muddy situation in these areas also cause waste collection vehicles to get stuck and require to be pulled every time, a cost that such service providers would not like to incur (Interview with the Head of Refuse Collection, Kasusu Waste Management Company on 12th February, 2009).

The lack of access to solid waste removal has negative impacts. The most is the throwing of waste on open spaces as an alternative method of waste disposal (See Table. 1). A total of 107 (36%) surveyed residents from Kapoto (23), Chipata (17), Buchi (17), Wusakile (5), Chimwemwe (12) and Mulenga (33) indicated using this method. These comprised the residents not able to afford service charges and are located far away from the free services being provided by the council i.e. communal waste points and market dumpsites or their residential plots are small to dig a ditch/pit for waste burning/burying. As a result, the residents in Kapoto throw waste in the open spaces near the bushes south of the compound while those in Chipata use the bush bordering the Copperbelt University. In Mulenga, the residents throw waste on the open spaces along Ndola - Kitwe road (dual carriageway), the Mate - Mate Stream, “Pa ka Presidents Bridge and “Pa Ka Catholic Bridge”. Furthermore, those using this method in Chimwemwe
indicated throwing waste on the open space along the ZESCO power lines and along Chingola Road.

Table 1. The Distribution of Responses by methods of solid waste disposal

<table>
<thead>
<tr>
<th></th>
<th>Receive services from the public/private waste collectors</th>
<th>Throw waste on open spaces</th>
<th>Throw waste on streets / road alleys</th>
<th>Throw waste in ditches for burying/burning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wusakile</td>
<td>35</td>
<td>5</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Buchi</td>
<td>24</td>
<td>17</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Mulenga</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Chipata</td>
<td>0</td>
<td>17</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>Chimwemwe</td>
<td>31</td>
<td>12</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Kapoto</td>
<td>0</td>
<td>23</td>
<td>0</td>
<td>27</td>
</tr>
</tbody>
</table>

Source: Compiled from field data

The throwing of waste on open spaces and streets is socially unacceptable. This practice usually occurs at night to avoid being seen and residents accepted the fact that they did so with the perception that the council will collect the waste or it will decompose by itself and later washed away by running water especially during the rainy season (Interview with Mrs. Lucy Namonje, Chimwemwe Resident, 4th March, 2009). It was also discovered that most households consider the open spaces as permanent disposal sites and there nature with uncollected garbage attracted flies, rats and other disease vectors breeding organisms causing ecological impacts. Other residents using open spaces indicated burning wastes to reduce uncollected garbage which they acknowledged caused extensive airborne smoke and release of gases, a health hazard to people. (Interview with the Market Cashier, Buchi-Kamitondo Market, Kitwe City Council on 4th March, 2009).

The study also established that there was no specificity on the alternative methods of waste disposal used by a total of 36 (12%) residents from Chipata (27) and Wusakile (9). The common answer to this question was that, since they do not receive any form of service from the
council they have resorted to throwing waste on the streets or road alleys and not on specific
dump sites. They indicated using this method because their residential areas do not have
adequate open spaces to be used as alternatives or their plots/yards were too small to
accommodate digging a ditch/pit for waste burning/burying. However, there are some residents
in Chipata (11) and Wusakile (5) who indicated throwing waste at the open space called “Paka
Bridge” and the open space surrounding communal toilets respectively.

The same reason for the indiscriminate throwing of waste on open spaces was given by
those using the streets and road alleys. Mountains of garbage were discovered in residential areas
such as Wusakile and the drains were found clogged with water flooding the streets with waste.
Where few drains exist, like the study areas of Buchi and Chipata, small furrows made by
households to carry gray water into the streets were found mixed with uncollected waste
resulting in the proliferation of vermin and disease vectors.

The digging of ditches/pits for the burying/burning of waste is the third alternative
method used by residents not accessing solid waste removal. A total of 67 (22%) respondents
indicated using this method (see Table .1). However, it was found that the use of a ditch was
determined by the availability of free space at residential plots. As a result, the majority using
this method came from Mulenga and Kapoto were the plots had enough space to dig a new ditch
and bury the old one when it became full. On the other hand, those without residential spaces
especially in Buchi and part of Wusakile indicated burning waste if a ditch became full for
further re-use, a thing which caused air and general environmental pollution.

The nature of and access to sewerage services
Everyone wishes to live in a home connected to a sewer. This connection, no matter the type of
flush toilet, should be adequately available. Therefore, sewerage services should be of prescribed
minimum standard, necessary for the safe, hygienic and adequate collection, removal and
disposal of human waste, domestic waste-water and sewage from households, including informal
households. In Kitwe, the Nkana Water and Sewerage Company manages the sewer reticulation
system (sewage treatment plants, main sewers, sub main sewers, local or lateral sewers,

It was found that a total of 103 (34%) residents use flash toilets connected directly to
their residents from a sewer line while 197 (66%) do not access sewerage services and these use
pit latrines as the alternative method of human waste disposal (See Chart.4.4). There was no response in terms of accessing sewerage services through a septic tank, a sewer system not connected to the main sewage pipes but uses a tank to decompose or mineralize the waste discharged in it. From the 103 (34%) accessing sewerage services, 33 (11%) residents were found using flash in toilets as the method of human waste disposal (See Chart.4.4). These came from Wusakile sections T and E (8), New Chimwemwe’s (Kawamya and Kaunda Square areas) (22) and Buchi (3). The residents from Buchi and New Chimwemwe using this method are those found in newly constructed houses with a design for an inside flash toilet. However, it was different in Wusakile and the households that were found using flash in toilets are old mine houses that were designed to accommodate such a facility (Interview with the Supervisor, Bulangililo Sewer Works, Nkana Water and Sewerage Company on 4th June, 2009).

Chart.4.4: The Distribution of the methods of human waste disposal

Source: Compiled from field data

The residents using flash out toilets 38 (13%) comprised the majority and these came from Chimwemwe (28) and Wusakile (10) (See Chart.4.4). The results were influenced by the location of a house and its design, thus, the residents using this facility were discovered to be one bed roomed houses with no designs for inside flash toilets in Old Chimwemwe and Wusakile (section B and D). The flash out toilets in Old Chimwemwe are located outside and adjacent to a
house while those in Wusakile are not adjacent to a house but are found in an ablution block located at the centre of four houses accommodating showers and yard taps to be accessed by individual households within their residences. Flash out toilets in Wusakile were installed recently to replace the widely used communal toilets in this study area. The flash out toilets were installed by the NWSC through a Devolution Trust Fund funded project. However, due to insufficient funding, the project was not fully implemented, thus, subjecting the majority Wusakile residents to continue using the shared communal toilets (Interview with Mr. Ackim Muwezhi on 24th May, 2009 in Wusakile).

It was, therefore, discovered that all the 32 (10%) households that indicated using communal toilets came from Wusakile (See Chart.4.4). These came from the sections C, B and D the areas that did not benefit from the DTF project to install flash out toilets at residences. The communal toilets are owned by the NWSC and managed with corroborations from stakeholders. In active communities, RDCs and CBOs were found collecting K10, 000 from households as service charges for sewerage services each month on behalf of the NWSC. Like the sharing of communal taps, the residents using this facility indicating sharing it with ten other residents within a community, which is unsanitary, especially with high cases of overcrowding from large family composition and renting practices (Interview with the Chairperson, Resident Development Committee (Wusakile Section B) on 5th May, 2009).

The provision of sewerage services (flash in, flash out and communal toilets) by the Nkana Water and Sewerage Company also comes with customer services. The company collects, conveys, treats and dispose sludge and sewerage waste with a 24 hours designed capacity. It also attends to the problems of; sewage overflows, odor complaints and response/reaction time to incidents); and continuity of sewerage services in the long term within time. For instance, it was found that the line breaks and chokes, and sewer inflow/infiltration are rectified within a specific period to avoid health risks.

The provision of sewerage services in the high density areas in Kitwe is necessitated by the NWSC sewer infrastructure covering a distance of 100 km long, grouped into eleven (11) systems and supported by two (2) pumping stations (Bulangililo and Nkana East Sewer Works). Human waste is disposed at sewer ponds located in Bulangillilo and Nkana East. The sewer system also has allowances to incorporate and accommodate storm water that may unintentionally enter the systems through uncovered manholes, leaking pipes or illegal roof
drainages. (Interview with the Supervisor, Nkana East Sewer Works, Nkana Water and Sewerage Company on 6th June, 2009).

It was found that the NWSC offer sewerage services starting from a household sewer junction (jump up) to the property boundary, if the junction is outside the property. In this case, residents are responsible for the sewer drain to the sewer junction or to their property boundary, if the connection is outside. The sewer network’s junctions are generally within 1.5 meters of the lowest corner of residents. The residents are also responsible for the maintenance and plumbing of pipes and fixtures in the premises up to and including the point of connection within the sewer network. The company also indicated that it subjects all sewer connections to inspection and approval before undertaking building or construction activity on land connected or capable of being connected. If customers carry out unauthorized property improvements, which can interfere with sewer network, they are subjected to incur for their removal and/or remedial

(Interview with the Public Relations Manager, Nkana Water and Sewerage Company on 5th February, 2009).

It was also discovered that the service provider interrupts, postpones or limits service provision when: any part of the sewer system is damaged, (bursts, blockages or breakdowns); when it is necessary to inspect, maintain, repair or replace part of the system; during the connection of new works or services; if an event occurs outside of the company’s control, including acts of vandalism, sabotage and civil commotion, as well as landslide, power shortage or industrial action. The services are also interrupted when the event or a situation arises that entitles to the NWSC to disconnect a service and where there is a possibility of a significant health risk arising (Interview with the Company Engineer, Nkana Water and Sewerage Company on 6th February, 2009).

The extent of satisfaction with sewerage services

The study also investigated the level of satisfaction among residents receiving sewerage services from the NWSC. Majority (80%) accessing sewerage services complained of poor service delivery because of the frequent sewer blockages, sewer bursts, as well as toilet sharing. It was also found that the lack of drainage systems and the digging furrows with no proper engineering measures make the problems worse. It was established that waste from kitchen use, washing and bathing runs through improvised furrows into the streets and open spaces, picking up all sorts of
waste; outdoor materials (leaves, grass, clippings, branches and woody debris), waste from the kitchen activities such as plate washing, oil, petrol, grease, sediment, industrial waste and other litters. This waste ends up sipping into sewer mains (Interview with Mr. John Kakwenda. Buchi Resident on 17th March 2009).

The effects of wastes sipping into sewer mains cause overflowing of human waste and spillage of effluents into residential areas, a health hazard especially with overcrowding and toilet sharing. Furthermore, toilets such as the communal toilets in Wusakile end up being used even by passersby and people vending in the streets; a common practice that was discovered indeed. Residents using communal toilets also complained of the NWSC negligence to maintain these facilities especially with irregular/unreliable water supply which affects sufficient and accessible water needed for flashing and unblocking toilets to reduce dirtiness, awful smells and swarms of flies in order to maintain cleanliness (Interview with Mrs. Mary Nsofwa, Wusakile Resident. 26th September, 2009).

About, 197 (66%) of the residents from Chipata (50), Mulenga (50), Kapoto (50) and Buchi (47) do not have access to sewerage services from the NWSC and the reasons for this are many. Firstly, NWSC lacks the capacity to increase service coverage to subserviced areas, especially the informal settlements. This lack of capacity stems from operational problems, lack resources to install and expand its sewer network infrastructure which is small and old, installed almost fifty years ago to meet the high demand for the services now. Furthermore, the company, has a low revenue base which is not enough to fund the installation of new infrastructure, expand service coverage as well as collect, transport and dispose sewerage in the high density areas (Interview with the Branch Manager, Ndeke Zone, Nkana Water and Sewerage Company on 5th May, 2009).

The other reason that was found to be making it difficult for the NWSC to expand service coverage was the lack of ability by the majority households to afford installation costs and service charges especially in the informal settlements. Again, even if the NWSC had to install sewerage infrastructure, the areas are not feasible because of settlement density or availability of water. The installation of sewer structures is unattainable in informal settlements considering their illegal status and therefore, installation will require recognizing their legal existence, proper planning and demolishing poorly designed houses to meet the requirements that stipulate that sewer networks depends on the gradient of land for installation. The other reason that has caused
low access is the reluctance by residents to connect to the existing sewer grids. The perceived high costs of installation and service charges can be shared with other would be users i.e. the renters and by far outweighs the use of unsanitary pit latrines.

Due to low service coverage and reluctance among households, 197 (66%) majority residents, mostly from the informal settlements were found using pit latrines (ground level/raised pit latrines) as the alternative method of human waste disposal The raised level pit latrines, made of cement blocks were considered to be stronger unlike the ground level pit latrines which are less expensive, constructed in sinkholes, on a structure made of sacks, plastics, grass or any other available materials (See Picture .1). However, despite the differences in constructions these latrines are simply a hole, hand dug in the ground, with a cover slab made of wood, mud (or occasionally mortar) overlaying the wood, and some sort of structure built for privacy.

Picture.1. Raised and Ground Level Pit Latrines

When physically inspected, the pit latrines were discovered not deep with slab floors or smooth enough to keep the impervious surface clean for better sanitation. Instead they were found dirty and acting as a breeding area for flies and other diseases carrying organisms. The pit latrines were also found vulnerable to collapse; if made of ordinary mud the inflow of water on the surface of the pit was likely to erode its sides and if made of wood slab, they are subjected to attack from termites or rot. Their nature also makes children vulnerable to fall into them and this encouraged open defecation, an act which is unsanitary especially with overcrowding in the informal settlements of Chipata, Kapoto and Mulenga.

**Conclusion**

In conclusion, there are problems of solid waste removal in Wusakile, Buchi, Chimwemwe, Kapoto, Chipata and Mulenga. It was found that only 90 (30%) residents have access to solid waste removal services from both the Public Sector (Kitwe City Council) and the Private Sector (Private Waste Collectors). The nature, extent and satisfaction with solid waste collection, transportation and disposal provided through door-to-door waste collection, collection of waste at communal and market dumpsites were examined. It was discovered that, a large number of the surveyed residents do not access solid waste removal services and instead throw waste on open spaces, streets/road alleys and hand dug pits for waste burying/burning as alternative methods of solid waste disposal.

The types of sewerage services, access to flash toilets (flash in toilets, flash out toilets and communal toilets) were examined. It was also found that access to these services was significantly influenced by the design of a house and its location. Lastly, it was revealed that the majorities of the residents do not have access to sewerage services and indeed there is low service coverage by the NWSC which has led the majority surveyed households to use unsanitary pit latrines as the alternative method of human waste disposal.
REFERENCES


CHAPTER FIVE
CONCLUSION

Water and sanitation service delivery in the high density areas of Kitwe exhibit a pattern common to urban areas in developing countries. Although there are institutional structures in providing the services, the overall conclusions made in relation to the data that was collected and analyzed is that there is inadequate provision of water supply and sanitation in the high density areas of Kitwe.

The study has revealed that water supply, judged in terms of availability, quantity and quality, is far from satisfactory. Although, the NWSC provide piped water supply through in-house water connections, yard taps, communal taps and water kiosks, the services are inadequate. This was evidenced by complaints of frequent pipe breakdowns, service interruptions, water shortages and slow response times. The water supply was also discovered to be irregular, unreliable, of poor quality and low pressure that cannot even relieve the residents of their bleak water supply situation. This trend seems to have arisen from a variety of reasons which were provided in the study. With most of the residents saying that they were not getting adequate quantities of water for their various domestic needs, it became imperative to assess how the people were affected in their day-to-day activities.

It was revealed that the majority residents not accessing piped water supply are those with low-incomes in the informal settlements of Kapoto, Chipata and Mulenga compounds. Therefore, since portable water has not reached them, they have resorted to the use of unsafe sources, the hand dug wells as alternative source(s) of water. However, the few residents accessing piped water in the informal settlements are those using water kiosks or can afford the cost towards installations, water tariffs and maintenance of piped water. As a result, it was revealed that a large percentage of residents virtually have no water, thereby making their lives vulnerable considering the undisputed fact that water is life.

The low service coverage in the informal settlements has also been attributed to the rise in urban poverty and the increasingly informal nature of the city. The illegal status and haphazard layout of informal or unplanned areas make extension of network infrastructure and service coverage difficult. The capacity of the NWSC is presently low as it has been presented and therefore, if the urbanization increases, then the current levels of supply may be insufficient in the high density areas. Any sort of measure to increase service coverage are low and, in fact,
beyond the required demand. So in future, the possibility of more people not accessing water services cannot be ruled out. Therefore, to increase water supply, the first step is to make a strategy to improve access to private connections by facilitating the extension of service coverage to areas with few or without network services. It is therefore necessary to consider alternative options that suit the local conditions in high density areas such as informal settlements with low service coverage.

Equally, access to sewerage services (sanitary facilities), that are safe is equally low and inadequate. Firstly, sewerage systems in Kitwe serve few people and only cover a small fraction and even where available, the connection costs are high and unaffordable for poor households in Buchi, Kapoto, Chipata and Mulenga. Secondly, for those households within the proximity of the sewerage network, the cost of a connection can be twice as much as a water connection because of distances from sewer network grids. It can therefore be concluded that, low access to sewerage services is attributed to the higher costs associated with developing, connecting to and using sewerage systems. For instance, once connected, households also incur a wastewater charge that may represent over 50% (sometimes as high as 90%) of the water bill.

Only a small proportion of people have access to flash toilets (whether private or communal toilets). This inadequacy has forced residents to resort to using shared and unsanitary pit latrines as the alternative methods of human waste disposal. The evidence also show that the pit latrines are unsanitary, not ventilated and simply built with cheap materials such as mud bricks, soil, wood and plastic not strong enough. Therefore, it can be concluded that the only way to help the poor households is to facilitate the use of on-site sanitation by using ventilated pit latrines as a viable option in the foreseeable future. As households will continue to be responsible for developing and managing these facilities, access to finance will be a key factor in the drive towards improved sanitation for the poor. Efforts will need to focus on developing a sustainable financing and upgrading approach that provides households financial support, technical inputs, and the incentive to improve their sanitation facilities.

The other service that has been considered to have failed most strikingly is solid waste removal. The capacity to provide door-to-door collection, collection of waste at communal waste points and market dumpsites (by the Kitwe City Council) and door-to-door waste collection (by the Private Waste Collectors) was found to be inadequate. Where the services are provided, it is unreliable, irregular and inefficient as was evidenced by the indiscriminate dumping of waste on
opens spaces, streets/road alleys including burying/ burning and as alternative methods of solid waste disposal. For these responses, the residents gave various reasons. Furthermore, many, particularly the low-income/informal settlements receive little or no services. The lack of accessibility to the unplanned areas has also hindered the increase of service coverage to these areas.

Given the magnitude and scale of the problem, improving water supply and sanitation service delivery in the high density areas is a priority for most governments and utilities. Just to maintain current levels of coverage - in the face of natural growth and rural to urban migration - the served urban population must increase. To achieve this increase, the ‘business as usual’ scenario is not an option. Concerted effort is required by all actors involved in service delivery to identify innovative solutions and appropriate mechanisms for reaching the residents especially the low-income urban communities. However, given their critical role in water and sanitation service delivery, utilities will have to act as institutional anchors, working in partnership with municipalities, NGOs, CBOs and private providers. A reasonably efficient and financially viable utility are therefore a necessary condition for progress. Further, this objective would require political commitment to these goals, backed by resources and action, is essential if utilities are to prevent a widening of the gap between ‘served’ and ‘unserved’ households.

Again, the inadequacies in the provision of water and sanitation service delivery cannot, however, continue. Finding answers to the problem of water and sanitation delivery in the high density areas of Kitwe requires concerted efforts by a more proactive and progressive leadership at all levels. Above all, a more autonomous local authority with full control over the affairs of the city, including its finances and management, seems desirable. For instance, the Kitwe City Council, as the local authority, however, requires more comprehensive and fundamental democratic decentralization and an acceptance by those who wield political power. As a result, there is need for an autonomous and democratically elected and decentralized local authority which should be more responsive to the needs and concerns of the ordinary residents and the plight of the poor facing the problem of inadequate water supply, solid waste removal and access to sewerage services.
BIBLIOGRAPHY


APPENDICES

APPENDIX: I

HOUSEHOLD QUESTIONNAIRE

QUESTIONNAIRE

I am a final year student at the University of Zambia pursuing a Masters Degree in Public Administration (MPA). I am currently carrying out a study on Water and Sanitation Service Delivery in High Density Areas of Kitwe.

You are randomly selected and asked to participate in the study by answering the questions below as honestly as possible. This questionnaire attempts to collect information on water and sanitation service delivery in high density areas of Kitwe. The information to be collected is for academic purposes only and your response will be kept strictly confidential and your names will not be published. Please you should feel free and make comments were possible during your answering of questions for the research. I would be very grateful if you can give your fullest cooperation in answering the questions posed in this questionnaire.

Thanking you in anticipation.

RESEARCHER
PERSONAL DATA

1. Sex

(a) Male  (b) Female

2. Name of residential area?

3. How many years have you lived in this area?

(a) Less than One Year
(b) Between 1 and 5 years
(c) Between 5 and 10 years
(d) More than 10 years

4. How many members of the family do you live with (house composition)?

(a) Less than 5 members
(b) Between 5 and 10 years
(c) More than 10 years

5. Do you have cabins at your residence (yard/plot)? What is the reason for constructing such a structure?

(a) Due to large family composition
(b) For renting purposes
WATER SUPPLY AND ACCESS

6. What is the main source of the water that you use for your household?

(a) In-house water connection
(b) Yard tap
(c) Communal tap
(d) Water Kiosk
(e) Hand dug well
(f) Other (Specify)

7. If the answer to Question 6 is, “Hand dug wells” and “Others” why is this so?
............................................................................................................................................................
............................................................................................................................................................

8. How long does it take you to draw water and what is the distance from the water source mentioned in Question 7” from your house? (Approximate time and distance)
............................................................................................................................................................
............................................................................................................................................................

9. How many other family members do you share with, this source of water used by your household. Kindly explain?
............................................................................................................................................................
............................................................................................................................................................

10. If you use piped water systems (In-house water connection, yard tap, water kiosk and communal tap), which water utility company provides this service? Name the Company?
............................................................................................................................................................
............................................................................................................................................................

73
11. Do you think the services provided by this company satisfy your water needs?

(a) Yes  
(b) No  
(c) Don’t know

12. Justify your answer to question 11?

............................................................................................................................................................
............................................................................................................................................................
............................................................................................................................................................

13. In terms of quality how can you rate the quality of water that this company supplies to you?

(a) Satisfactory  
(b) Very Satisfactory  
(c) Some what Satisfactory  
(d) Not Satisfactory  
(e) Not Sure

14. Elaborate your answer to question 13?

............................................................................................................................................................
............................................................................................................................................................
............................................................................................................................................................

15. How often (frequency) is the water supplied to residence is the service provider?

(a) All the time  
(b) Once a day  
(c) Never  
(d) Other (specify)
16. Elaborate your answer in Question 15 in terms of hours towards access to water supply on a daily basis (service hours)?.

............................................................................................................................................................
............................................................................................................................................................

17. Is the water that is supplied to your household metered?

(a) Yes
(b) No

18. In terms of dispatching water bills monthly, how can you rate this water supplier?

(a) Within time
(b) Not in time
(c) Don’t Know
(d) Other (specify)

19. Elaborate your answer in Question 18?

............................................................................................................................................................
............................................................................................................................................................

20. With regards to affordability. Does your household afford to pay for the tariffs (water bills)?

(a) Yes
(b) No
21. If the answer is “Yes” in Question 20, how can you rate the Charges?

(a) Very Fair  
(b) Fair  
(c) Somewhat fair  
(d) Not Fair  
(e) Other (specify)

22. Elaborate your answer in Question 21?

............................................................................................................................................................
............................................................................................................................................................
............................................................................................................................................................

23. How can you rate this company in terms of reliability towards replacing damaged water supply infrastructures such as leaking water pipes?

(a) Below average  
(b) Average  
(c) Above Average  
(d) Don’t Know

24. Elaborate your answer in Question 23?

............................................................................................................................................................
............................................................................................................................................................
............................................................................................................................................................

25. What is the response of the water service provider in terms of responding to customer complaints?

(a) Very Prompt  
(b) Prompt  
(c) Not Prompt  
(d) Don’t Know
26. Justify your answer in question 25?
............................................................................................................................................................
............................................................................................................................................................

27. Do you remember any water crisis that has occurred in your area this year?
(a) Yes
(b) No

28. If “Yes”, what was the frequency and what where the months and dates in which this occurred?
............................................................................................................................................................
............................................................................................................................................................

29. If there is intermittent water supply and pro - longed water shortage what is your alternative sources of water that you use? Kindly explain
............................................................................................................................................................
............................................................................................................................................................

SOLID WASTE REMOVAL AND ACCESS TO SEWERAGE SERVICES

30. What kind of toilet facility does your household use?
(a) Flush inside toilet
(b) Flush outside toilet
(c) Communal flash toilet
(d) Septic tank
(e) Pit latrine

31. Elaborate your answer in Question 30.
............................................................................................................................................................
............................................................................................................................................................
32. If you use piped sewerage services (Flush outside, flash inside and communal toilets) who is the service provider (company)? Kindly explain
.................................................................................................................................................................................................
.................................................................................................................................................................................................

33. How can you rate the services charges from the company mentioned in Question 32?

(a) Very Fair
(b) Fair
(c) Some what fair
(d) Not Fair
(e) Other (specify)

34. Elaborate your answer in Question 33.
.................................................................................................................................................................................................
.................................................................................................................................................................................................

35. How can you rate this company efficiency towards managing sewerage waste in your area?

(a) Below average
(b) Average
(c) Above Average
(d) Don’t Know

36. Justify your answer in question 35?
.................................................................................................................................................................................................
.................................................................................................................................................................................................
37. Do you face any problem of sewer breakage/spillage/bursting in your area?

(a) Yes
(b) No

38. Elaborate the answer in Question 37 and describe the situation?
............................................................................................................................................................
............................................................................................................................................................

39. If the toilet facility is a communal toilet how long and far is it from your residence?
(Approximate time and distance)
............................................................................................................................................................
............................................................................................................................................................

40. If the toilet facility is a flash outside or communal toilet do you share the facility with other households?
(a)Yes
(b) No

41. If your answer in Question 40 is “Yes”, how many households or number of people make use of this facility?
............................................................................................................................................................
............................................................................................................................................................

42. Are there problems of drainage systems in your area?

(a) Yes
(b) No
43. If the answer to Question 42 is, “Yes” how can you describe the situation?

............................................................................................................................................................
............................................................................................................................................................
............................................................................................................................................................

44. Who provides waste removal services for your household?

(a) Public Sector
(b) Private Sector
(c) No service

45. Elaborate your answer in Question 44? (Provide names)

............................................................................................................................................................
............................................................................................................................................................
............................................................................................................................................................

46. What type of solid waste removal do you receive from the service provider indicated in Question 45?

(a) Door to door waste collection
(b) Dumping of waste at a communal waste point
(c) Dumping of waste at a market dumpsite
(d) Receive no service

46. If you receive solid waste removal services (door to door waste collection, dumping of waste at a communal waste point or dumping of waste at a market dumpsite), are you satisfied with the services?

(a) Satisfied
(b) Some what satisfied
(c) Not satisfied
47. Elaborate your answer in Question 46?
............................................................................................................................................................
............................................................................................................................................................

48. If you answer in Question 46 is, “No service”), what are your alternative methods of solid waste disposal at your residence?
(a) Throw waste in ditches for burning/burying
(b) Throwing waste into the streets/road alleys
(c) Throwing waste on open spaces
(d) Others specify

49. Justify your answer in Question 48?
............................................................................................................................................................
............................................................................................................................................................

50. If you receive waste removal services from the Public Sector through the Kitwe City Council, how do you rate its performance in terms of service delivery and service charges?
(a) Fair
(b) Some what fair
(c) Not fair
(d) Other (specify)

51. Elaborate your answer in Question 50?
............................................................................................................................................................
............................................................................................................................................................
52. If you receive waste removal services from the Private Sector through Private waste collectors, name the company and how do you rate its performance in terms of service delivery and service charges?

(a) Above average  
(b) Average  
(c) Below average  
(d) Other (specify)

53. Elaborate your answer in Question 52

...........................................................................................................................................................
...........................................................................................................................................................

54. If there is inadequate solid waste removal services within your community, are there community initiatives aimed at addressing the problem?

...........................................................................................................................................................
...........................................................................................................................................................

55. What do you feel is the role of households in helping address the problem of garbage collection within your community?

...........................................................................................................................................................
...........................................................................................................................................................

56. Describe any suggestions on how the problem of water and sanitation service delivery can be improved?

...........................................................................................................................................................
...........................................................................................................................................................
...........................................................................................................................................................
...........................................................................................................................................................

THANK YOU VERY MUCH
APPENDIX: II

INTERVIEW GUIDE FOR THE KITWE CITY COUNCIL

QUESTIONNAIRE

I am a final year student with the University of Zambia pursuing a Masters Degree in Public Administration (MPA). I am currently carrying out a study on the Water and Sanitation Service Delivery in High Density Areas of Kitwe.

You are randomly selected and asked to participate in the study by answering the questions below as honestly as possible. This questionnaire attempts to collect information on water and sanitation service delivery in high density areas of Kitwe. The information to be collected is for academic purposes only and will be kept as strictly, confidential and no names will be published. Please you should feel free and make comments were possible. I would be very grateful if you can give your fullest cooperation in answering the questions posed in this questionnaire.

Thanking you in anticipation.

RESEARCHER
1. The city of Kitwe is regarded as the second highly populated city in Zambia; can you tell us a brief history of its origin and population increase?

2. Does the Council have committees who look on specific programs of water and sanitation service delivery? If you have any, what are their objectives and who are the members of such committees.

3. Large accumulation of Garbage is a common major problem in many cities worldwide. Does the council have a deliberate policy on handling the problem of garbage collection? Who is in charge of this and what is being done to address the problem?

4. How does the council manage drainage systems in the high density areas?

5. Do you think the council raises enough revenue to sustain the delivery of sanitation services?

6. Do you think the council has enough capacity to handle the pressure of population increase versus the provision of sanitation service delivery?

7. What in your view are the main hindrances that are causing the council not to provide equitable sanitation service delivery to its population?
8. Non-Governmental Organizations and the private sector play a vital role in addressing the problem of sanitation service delivery in high density areas. How is this sector helping the council?

9. Do you think the individual households and communities are doing enough to improve the water and sanitation problems in Kitwe?

10. Does the council have any plans to expand service provision?

THANK YOU VERY MUCH

85
APPENDIX III

INTERVIEW GUIDE FOR THE NKANA WATER AND SEWERAGE COMPANY

QUESTIONNAIRE

I am a final year student with the University of Zambia pursuing a Masters Degree in Public Administration (MPA). I am currently carrying out a study on the Water and Sanitation Service Delivery in High Density Areas of Kitwe.

You are randomly selected and asked to participate in the study by answering the questions below as honestly as possible. This questionnaire attempts to collect information on Water and Sanitation Service Delivery in High Density areas of Kitwe. The information to be collected is for academic purposes only and will be kept as strictly, confidential and no names will be published. Please you should feel free and make comments were possible. I would be very grateful if you can give your fullest cooperation in answering the questions posed in this questionnaire.

Thanking you in anticipation.

RESEARCHER
POSITION:  

DATE OF INTERVIEW:  

QUESTIONS

1. Kindly give us a brief history of your company since its inception to date?

............................................................................................................................................................
............................................................................................................................................................

3. In terms of service provision give us the number and names of the residential areas that your company covers (service coverage)?

............................................................................................................................................................

5. Kindly tell us about the metered of water supply services (figures of the metered and unmetered customers)?

............................................................................................................................................................
............................................................................................................................................................

5. What type of services does your company provide to high density areas under study?

............................................................................................................................................................
............................................................................................................................................................

6. How can you describe the situation of housing, population and sanitation in high density areas and how do they affect your company’ towards water and sewerage provision?

............................................................................................................................................................
............................................................................................................................................................

7. How does your company collect, treat and dispose waste water and sewerage for the residential areas that you serve?

............................................................................................................................................................
............................................................................................................................................................

8. How does the water kiosk scheme under your company operate and kindly tell us how many residential areas benefit from this?

............................................................................................................................................................
............................................................................................................................................................

9. How do communal facilities (toilets/taps) under the residential areas where they are offered operate? How are they managed and which areas does such facilities exist?

............................................................................................................................................................
............................................................................................................................................................

10. How much does your company charge for water supply and sewerage services to individual households or those using communal facilities?
11. What are the service hours for water supply in the high density areas under study?

12. Since your company resources for improving service delivery depends on revenue from user charges, how good is your billing system in terms of ensuring that you get the enough revenue from water bills?

13. What are the new measures that you have put in place to provide meter services to those residential area that are not-metered and what penalty do you give to defaulters who tamper with meters or fail to clear their bills?

14. What punitive measures do you give to those clients who default against the laid down rules with regards to handling your company infrastructures for instance reckless damage to company infrastructures through illegal connections and vandalism?

15. What are the common complaints that your company receive towards service provision? And how efficient is your company in dealing with complaints towards problems such as interruption of water supply, sewer spillage, blockage and bursting?

16. Does your company receive complaints of poor water quality and insufficient water supply from the customers and what do you do to address these problems when they occur?

17. How prompt and how long does it take for your company to respond to emergencies such as broken pipes, leakages, failure of the meter or sewerage blockages that can lead to water interruptions or provide a risk to the outbreak of water bone diseases?

18. Large accumulation of garbage is a common major problem in many cities. Does your company have a deliberate policy on handling the problem of garbage collection? How is such a program managed?
19. Kindly explain to us about your company’s capability of the water sources, water transportation systems, water reservoirs/dams, water treatment plants, water tanks, water distribution mains and other water supply facilities does your company have?

20. Does your company have programs and committees such as a peri-urban program specifically designed to handle the problem of water and sanitation service delivery?

21. What has been your company’s working relationship with Government Ministries / Agents, Non-Governmental Organizations (NGOs) and the private sector in working together to improve the problem of water and sanitation service delivery in Kitwe?

22. Does your company have the capacity to improve and expand service delivery?

23. What do you think is the level of people participation in improving service delivery both at the household and community level?

24. What in your view are the main challenges that you face in providing equitable sanitation service delivery?

25. What strategies have you put in place and what do you think is the best way in which your company can improve water and sanitation service delivery?

THANK YOU VERY MUCH
APPENDIX IV

LIST OF PEOPLE INTERVIEWED

1. Branch Manager, Commercial Zone, Nkana Water and Sewerage Company, 8th June, 2009

2. Market Cashier, Kitwe City Council, Chimwemwe Market, 13th April, 2010

3. Councilor, Kitwe City Council, Mulenga Compound, 13th April, 2010

4. Councilor, Kitwe City Council, Buchi, Market, 13th April, 2010

5. Public Relations Officer, Kitwe City Council, 4th May, 2009

6. Head of Refuse Collection, Kitwe City Council, 4th May, 2009

7. Senior Health Inspector, Kitwe City Council, 4th May, 2009

8. Public Relations Officer, Nkana Water and Sewerage Company, 12th June, 2009

9. Mr. Lameck Kazembe, Kapoto Compound, 8th May, 2009

10. Mrs. Mary Tembo, Mulenga Compound, 30th May, 2009 in

11. Mr. James Goma, Wusakile, 5th June, 2009

12. Mr. Masuzyo Soko, Buchi, 10th March, 2009


15. Company Engineer, Nkana Water and Sewerage Company, 15\(^{th}\) June, 2009

16. Company Secretary, Nkana Water and Sewerage Company, 18\(^{th}\) January, 2009

17. Branch Manager, Riverside Zone, Nkana Water and Sewerage Company, 26\(^{th}\) February, 2009

18. Branch Manager, Chimwemwe Zone, Nkana Water and Sewerage Company, 4\(^{th}\) April, 2009


20. Branch Manager, Commercial Zone, Nkana Water and Sewerage Company, 26\(^{th}\) January, 2009


22. Supervisor, Kafue Water Treatment Plant, 2\(^{nd}\) April, 2009

23. Supervisor, Bulangililo Water Treatment Plant, 4\(^{th}\) May, 2009


26. Environmental Health Officer, Kitwe District Medical Office. 5th June, 2009

27. Chairperson, Resident Development Committee (Wusakile Section B), 4th April, 2009

28. Mr. Gift Kakoma, Mulenga Compound, 15th June, 2009

29. Mr. John Mwale, Wusakile, 3rd March, 2009

30. Mrs. Bertha Chilufya, Mulenga Compound, 8th July, 2009

31. Mrs. Judith Chanda, Wusakile, 15th April, 2009

32. Mrs. Martha Sitali, Kapoto Compound, 6th May, 2009

33. Ms. Musonda Kalimanshi, Chipata Compound, 4th March, 2009

34. Mr. John Zimba, Chipata Compound, 3rd May, 2009

35. Public Relations Manager, Nkana Water and Sewerage Company, 5th February, 2009

36. Company Engineer, Nkana Water and Sewerage Company, 6th February, 2009

37. Branch Manager, Nkana Water and Sewerage Company, Riverside Zone, 3rd March, 2009

38. Branch Manager, Nkana Water and Sewerage Company, Ndeke Zone, 5th May, 2009

40. Supervisor - Nkana East Sewer Works, Nkana Water and Sewerage Company, 6\textsuperscript{th} June, 2009

41. Public Relations Officer, Kitwe City Council, 8\textsuperscript{th} August, 2009

42. Market Cashier, Kitwe City Council, Buchi/Kamitondo Market, 4\textsuperscript{th} March, 2009

43. Market Cashier, Kitwe City Council, Wusakile Market on 5\textsuperscript{th} March, 2009

44. Councilor, Kitwe City Council, Chipata Compound, 7\textsuperscript{th} April, 2009

45. Councilor, Kitwe City Council, Kapoto Compound, 6\textsuperscript{th} May, 2009

46. Councilor, Kitwe City Council, Chimwemwe, 2\textsuperscript{nd} September, 2009

47. Chairperson, Resident Development Committee, Section B, Wusakile, 5\textsuperscript{th} May, 2009

48. Head of Department, Community Health Services, Kitwe City Council, 4\textsuperscript{th} June, 2009

49. Senior Health Inspector, Kitwe City Council, 4\textsuperscript{th} June, 2009

50. Health Inspector, Kitwe City Council, 24\textsuperscript{th} February, 2009

51. Head of Refuse Collection, Kitwe City Council, 12\textsuperscript{th} June, 2009

52. Head of Refuse Collection, Kasusu Waste Management Company, 12\textsuperscript{th} February, 2009

53. Head of Refuse Collection, Copwaste Management Company, 22\textsuperscript{nd} April 2009

54. Environmental Health Officer, Kitwe District Medical Office, 3\textsuperscript{rd} April, 2009
55. Waste Picker, Maritime Waste Management Company, 4\textsuperscript{th} May, 2009

56. Mrs. Mary Nsofwa, Wusakile, 26\textsuperscript{th} September, 2009

57. Mr. John Kakwenda, Buchi, 17\textsuperscript{th} March, 2009

58. Mr. Ackim Muwezhi, Wusakile, 24\textsuperscript{th} May, 2009

59. Mr. Derick Sinyangwe, Wusakile, 6\textsuperscript{th} May, 2009

60. Mrs. Lucy Namonje, Chimwemwe, 4\textsuperscript{th} March, 2009

61. Mr. Mumba Kapeso, Chimwemwe, 10\textsuperscript{th} May, 2009

62. Mr. Boyd Chileshe, Kapoto Compound, 23\textsuperscript{rd} February, 2009

63. Mr. Pardon Mulendela, Chipata Compound, 12\textsuperscript{th} April, 2010